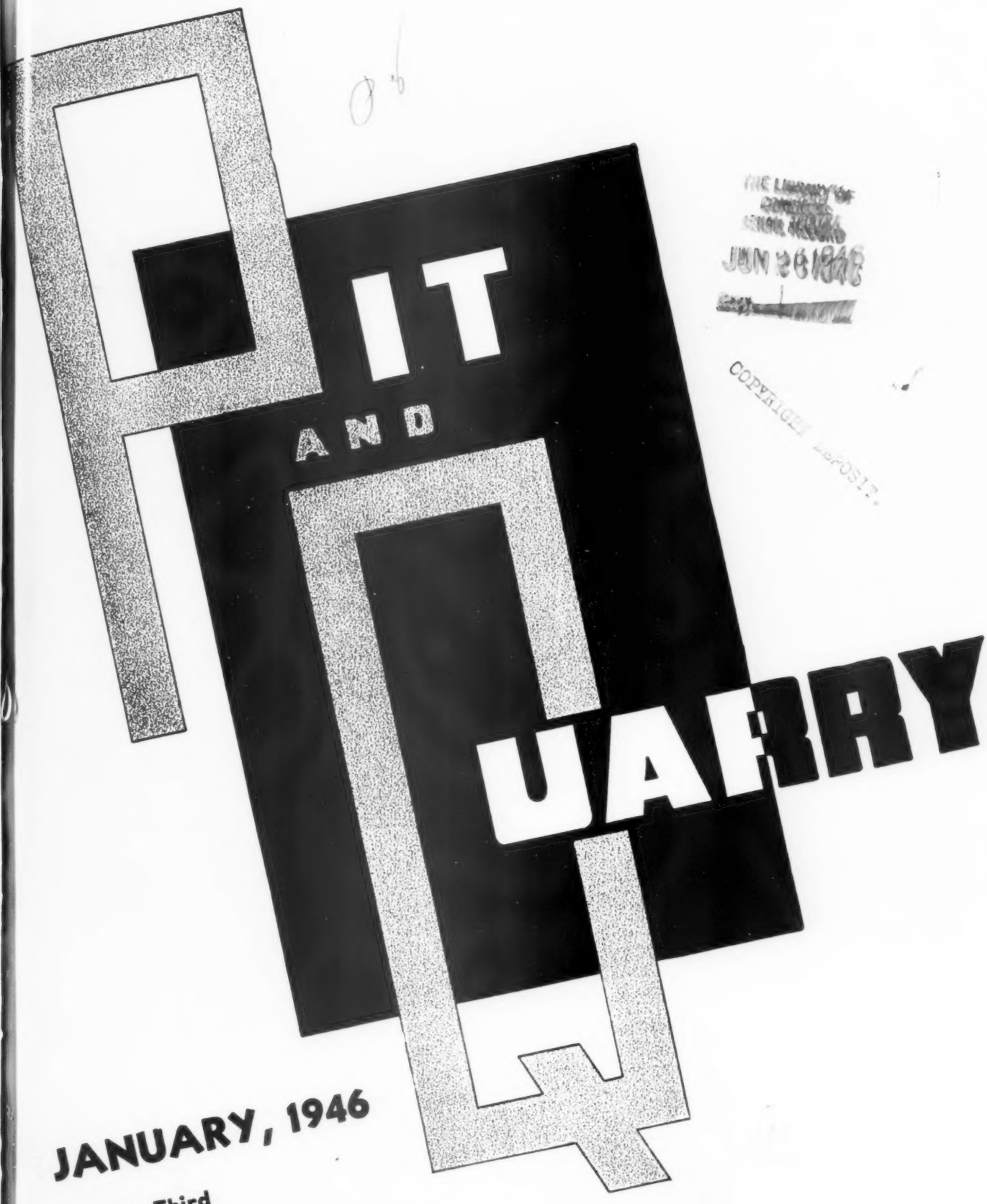

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JANUARY, 1946

Twenty-Third Annual Review Number

TOTAL NET PAID CIRCULATION NOW AT NEW ALL-TIME PEAK — OVER 8,000

FOR 29 YEARS THE LARGEST PRODUCER CIRCULATION IN THE FIELD

JUN 21 1946

MEMO

TO ALL CONSTRUCTION SUPTS...

Better look into High Speed Loading and make every truck count—

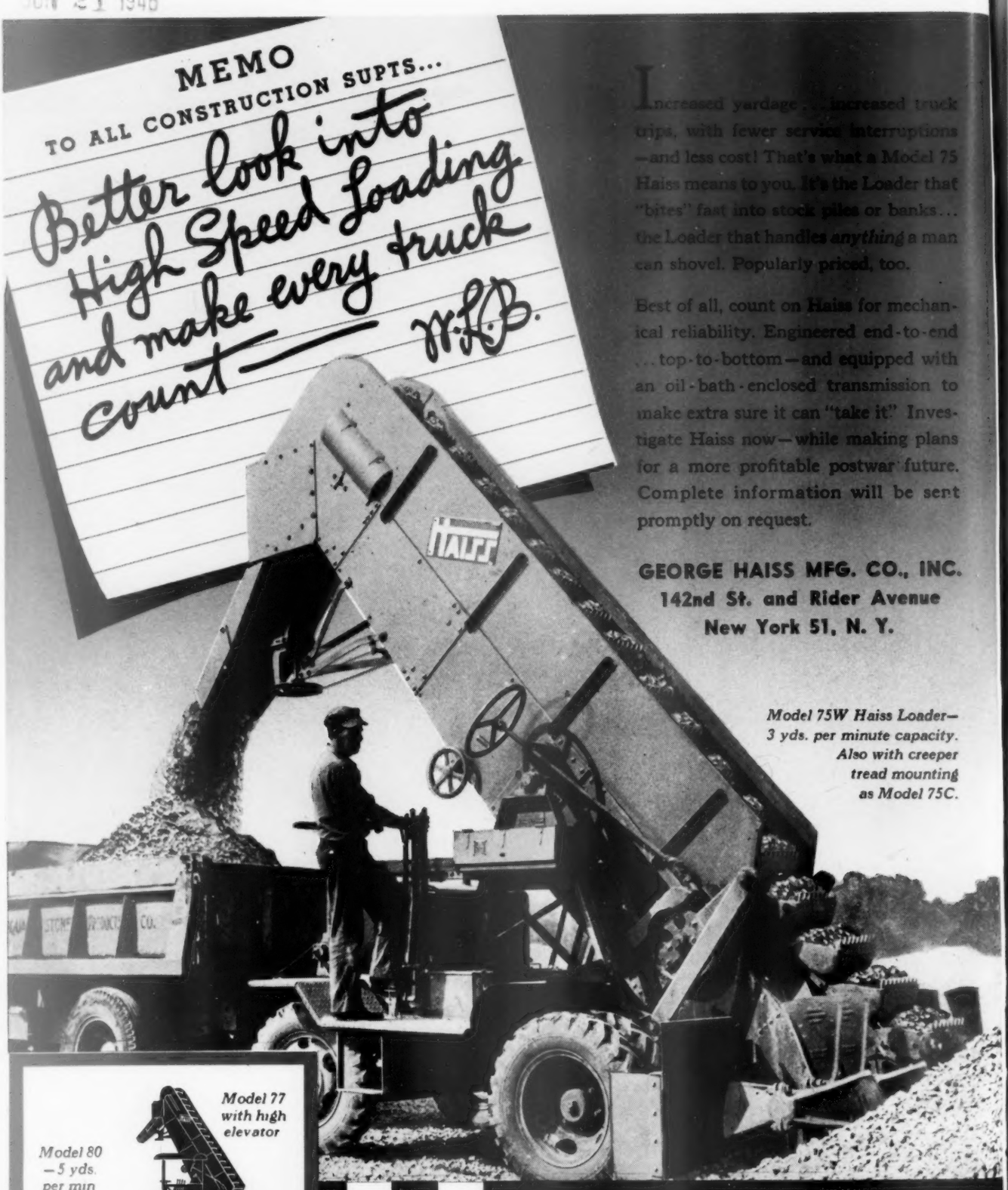
W.F.B.

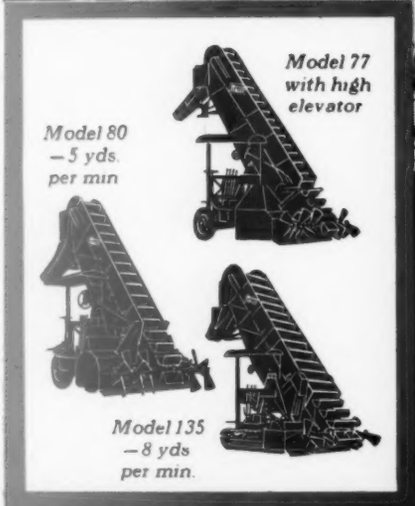
Increased yardage . . . increased truck trips, with fewer service interruptions—and less cost! That's what a Model 75 Haiss means to you. It's the Loader that "bites" fast into stock piles or banks . . . the Loader that handles *anything* a man can shovel. Popularly priced, too.

Best of all, count on Haiss for mechanical reliability. Engineered end-to-end . . . top-to-bottom—and equipped with an oil-bath-enclosed transmission to make extra sure it can "take it." Investigate Haiss now—while making plans for a more profitable postwar future. Complete information will be sent promptly on request.

GEORGE HAISS MFG. CO., INC.
142nd St. and Rider Avenue
New York 51, N. Y.

Model 75W Haiss Loader—3 yds. per minute capacity. Also with creeper tread mounting as Model 75C.





Model 77 with high elevator

Model 80 —5 yds. per min

Model 135 —8 yds per min.

HAISS

PORTABLE CONVEYORS ★ SNOW LOADERS ★ CLAMSHELL BUCKETS

HERE'S A WINNING TEAM

1350 FEET OF DRILL HOLE, EVERY SHIFT, PROVE IT

The combination of two FM-2 Wagon Drills and a K-500 Mobil-Air Compressor helped carve an airport out of solid rock in an unbelievably short time. The rock was of average hardness, yet this team drilled 75 holes every 8 hours—each hole being 18 feet deep.

This total of 1350 feet of drill hole per shift should give you a good idea of the lower drilling costs you can get by putting this team to work.

K-500 Advantages

The 2-stage, air-cooled K-500 Mobil-Air Compressor easily runs two FM-2 Wagon Drills. Equipped with our patented Drill-More Regulator, it provides up to 15% faster drilling and uses up to 40% less fuel to do an average drilling job. Other features are light weight, a convertible engine for operation on either gasoline or oil, a spring mounting and automotive steering.

FM-2 Advantages

The FM-2 Wagon Drill is extremely flexible. Holes can be drilled at any angle and set-up time is reduced. Drill steel feeding pressure from 0 to 1000 pounds is provided by a compact, sturdy air motor. The operator can easily select the right feed for any rock condition. Steel changing time is cut in half and drilling speeds are faster. The sturdy X-71WD Drill used on the FM-2 was developed especially for wagon-drill service. It hits a heavy hammer blow and has a unique follow-through characteristic which overcomes the inertia of long, heavy drill steel.

Ingersoll-Rand

11 BROADWAY, NEW YORK 4, N. Y.

5-711

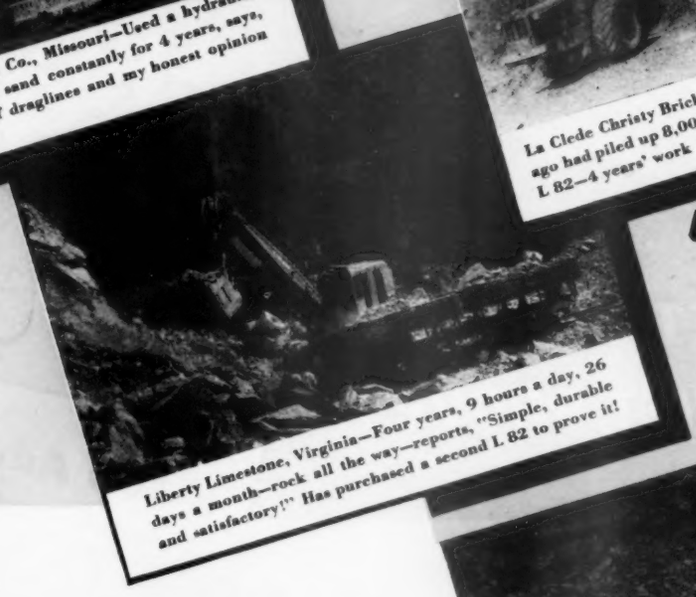
COMPRESSORS · CONDENSERS · TURBO BLOWERS · CENTRIFUGAL PUMPS · ROCK DRILLS · AIR TOOLS · OIL AND GAS ENGINES

PIT AND QUARRY, January, 1946. Vol. 38, No. 7. Published monthly by the Complete Service Publishing Company, 538 South Clark Street, Chicago 5, Ill. Subscription price $2 for 1 year in the U. S. and possessions, Canada, Central and South America; elsewhere $1 additional for each year. Single copies 25 cents. Entered as second-class matter February 28, 1932, at the Post Office at Chicago, Ill., under the Act of March 3, 1897.

First WITH HYDRAULIC DRIVE

Joseph Keel, Rental Equipment Co., Missouri—Used a hydraulic drive Lorain 82 in gumbo and sand constantly for 4 years, says, "We have operated 7 makes of draglines and my honest opinion is that Lorain tops them all!"

La Clede Christy Brick Co., Missouri—At last report a year ago had piled up 8,000 hours in 2 years on a hydraulic drive L 82—4 years' work in 2—and still going as strong as ever.



Liberty Limestone, Virginia—Four years, 9 hours a day, 26 days a month—rock all the way—reports, "Simple, durable and satisfactory!" Has purchased a second L 82 to prove it!

LOOK AT THIS RECORD...

Contractors Service Corp., Pennsylvania—handled 3,000,000 tons of rock a year with 5 Lorain 82's—50,000 tons a month per shovel for 12 months straight!

...AND STILL FIRST AFTER 5 YEARS!

There's no substitute for experience! And today when hydraulic drive is just coming into its own in construction equipment, Thew—who pioneered it in the shovel and crane field—can offer you tested hydraulic coupling equipped machines with 5 years of tough concentrated field work behind them!

Here—in the 2-yard Lorain 82—is hydraulic drive at its peak. You can't shock this shovel. Slam the dipper into the pile or tie into the biggest rock and the Lorain-engineered hydraulic coupling absorbs shocks and strains—reduces maintenance by lengthening machinery life. Not only that! The power hangs on like a bulldog till the rock is in the dipper—the engine never stalls.

Hydraulic drive plus Thew Center-Drive direct-to-the-point turntable power application; two speed chain drive crawler; all-steel, all-welded boom; all-steel dipper stick and new, one-piece, streamlined dipper make the "82" ideal for rock and other tough work.

Hydraulic drive can save you plenty! Be sure you get it at its *tested* best—in a proven Lorain 82. Ask your Lorain distributor for details today.

HYDRAULIC DRIVE STANDARD ON ALL LORAIN 82's *AT NO EXTRA COST*

Reg. Trade Mark

thew-Lorain

THE THEW SHOVEL CO.
Lorain, Ohio

CRANES • SHOVELS • DRAGLINES • MOTO-CRANES

MOVE MORE YARDS faster-at lower cost!

YARDAGES moved by power units at 3 miles an hour was *once* considered fast, low-cost hauling.

But today that speed is *high*-cost operation. Today those slow-moving units are obsolete—made so by modern equipment that rolls on rubber—on BIG pneumatic tires. For *BIG* tires roll easily over job-site bumps, make faster-hauling power units possible.

That's why earth-moving speeds are many times faster today. That's why today's rubber-tired equipment enables one man to fast-haul up to 15 tons and more at over 10 miles an hour, *and do so at lower costs-per-ton-mile than dirt was ever moved before!*

With gigantic postwar jobs planned the country over, earth-moving schedules will call for bigger and bigger yardages to be moved faster and faster. Your costs—and your contracts—will be determined by the speed with which you haul.

So plan now to get and hold your share of big jobs by putting your equipment on big tires. And when you're ready, choose with care—choose Goodyears. Job-proved tops in performance, Goodyear off-the-road tires come in 3 tread designs to meet all operational needs, deliver lower costs-per-ton-mile, are *first choice* with cost-wise contractors everywhere. It pays to buy—and specify—Goodyears.

Sure-Grip, All-Weather—T.M.'s The Goodyear Tire & Rubber Company

Caterpillar Diesel DW-10 tractor with Goodyear Sure-Grip tires pulling LaPlante-Choate Carrimor scraper on Goodyear All-Weather Earth Mover tires, moving heavy clay on airport job.

GOODYEAR

MORE TONS ARE HAULED ON GOODYEAR TRUCK TIRES THAN ON ANY OTHER KIND

The first new blasting development since the war

ATLAS ROCKMASTER

... less bark with more bite

THE Atlas Rockmaster is more than a different method of detonation. It's a *whole new system of blasting* —involving new methods of handling, use and loading—achieving results that are almost incredible.

Fragmentation—the "bite" that counts most to superintendents—is amazingly improved. Vibration—the "bark" that caused so many complaints—is greatly reduced. Back Break can be almost entirely eliminated. Any one of these advantages would mark the Rockmaster as an outstanding development. Combined, they make this System one of the really great advancements of the industry.

See your Atlas Representative about the Rockmaster Blasting System. Let him *demonstrate* how it saves time and money. Remember, too, that the Rockmaster gives you

the greater safety of

ATLAS MANASITE DETONATORS

Check these Features

- ✓ **NOISE AND CONCUSSION** are drastically cut down
- ✓ **ROCK BREAKAGE** is decidedly more complete
- ✓ **SECONDARY BLASTING** is reduced to a minimum
- ✓ **BACK BREAK** can be greatly reduced—more solid footage is assured

Identify the ROCKMASTER by the Blue Color

ATLAS EXPLOSIVES

"Everything for Blasting"

CHEMICALS ATLAS EXPLOSIVES

ATLAS POWDER COMPANY, Wilmington 99, Del. • ***Offices in principal cities*** • ***Cable Address—Atpowco***

Another Northwest in ROCK!

DRIVING the New Bozeman Pass Tunnel for the Northern Pacific was a Real Rock job and the Union Construction Co. of Great Falls, Montana, had real Rock Shovels to handle it with. Starting with two Northwest Rock Shovels in January the 300,000 Cu. Yds. of the approaches were out of the way before the middle of May.

Northwest brings you advantages that assure you better output in rock. Such features as the Dual Independent Crowd and the Northwest Welded Boom (and remember no Northwest Welded Shovel Boom has ever failed) warrant your investigation. Plan on Northwest Rock Shovel Performance on your future contracts—and you'll never have to worry about output on other classes of digging. We'll be glad to supply any desired information.

NORTHWEST ENGINEERING COMPANY

1822 Steger Bldg., 28 E. Jackson Blvd., Chicago 4, Ill.

—and when you have a real Rock Shovel you won't have to worry about output in dirt

NORTHWEST

SHOVELS • CRANES • DRAGLINES • PULLSHOVELS

DOWN GOES "DOWN-TIME"

Up Goes Daily Output!

SOCONY-VACUUM OIL COMPANY, INC., and Affiliates: Magnolia Petroleum Company, General Petroleum Corporation of Californ

PRINT IN BIND

Here's how Socony-Vacuum's Complete Service helps solve Contractors' Maintenance Problems!

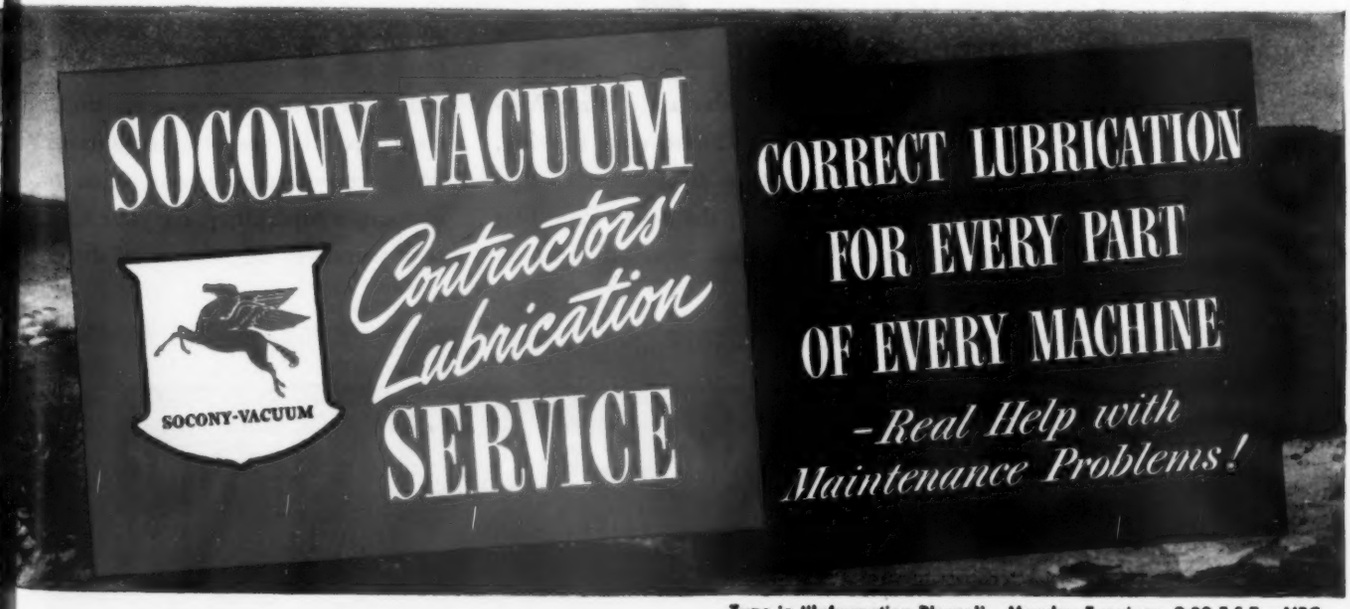
Whether you use 7 machines or 70, you get exactly the right oil or grease for every application. Socony-Vacuum's complete line of quality lubricants helps increase plant production, means . . . . . *Minimum Breakdowns!*

No matter where your job takes you, Socony-Vacuum's vast distribution facilities help you to reduce inventory problems — minimize field interruptions — by bringing you regularly scheduled . . . . . *On-the-Job Deliveries!*

To save time and boost machine output, you get field-tested maintenance schedules—carefully adapted to your individual needs. Also lubrication training for "green" help. Result . . . . . *Simplified Maintenance!*

Your Socony-Vacuum Representative always works *with* your men . . . is trained to analyze and solve equipment problems. If necessary, he can also call in qualified engineering aid to . . . . . *Help with "Problem" Equipment!*

Why Be Satisfied Merely With "Gas and Oil" When You Can Get Complete Service?



Tune in "Information Please"—Monday Evenings, 9:30 E.S.T.—NBC

N BINDING

AVOID IMPROPER FRAGMENTATION

...IT MEANS TROUBLE FOR JOHNNY AND TROUBLE FOR YOU!

● Little Johnny has produced "improper fragmentation" with the jam jar—and he'll be in the dog house when mother comes home. But it's much worse to get improper fragmentation with your explosives.

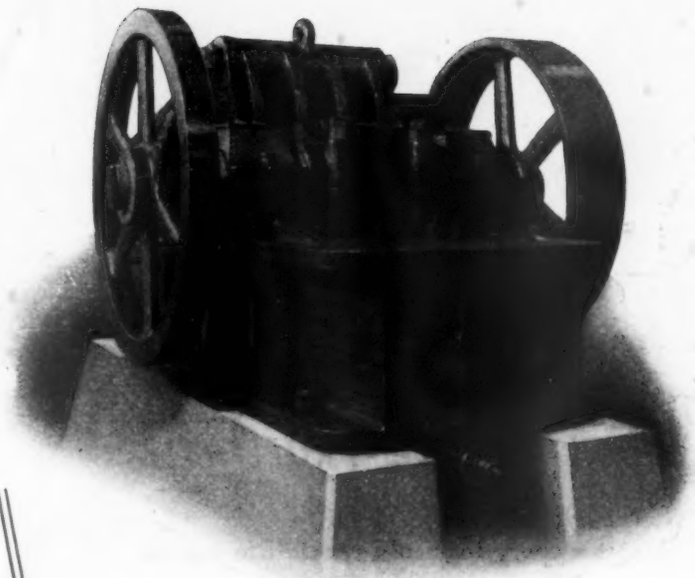
That's why so many quarry operators have learned to rely on Detonite—the patented, surface-sensitized high explosive that only King Powder can make. The heaving, shoving, *pushing* action of Detonite dislodges stone in the *right* sizes. Not only do you save wear and tear on your shovels, but you also get faster runs and more continuous operation.

The best way to find out what Detonite can do for you is to see it in action in your own quarry, under your particular operating conditions. For a convincing demonstration of Detonite's superiority, see your King representative, or write us direct.

KING EXPLOSIVES

THE KING POWDER CO. INC.
CINCINNATI 1, OHIO ..... INCORPORATED 1878

A Lightweight for a Heavyweight Job



Production figures obtained by many users support this statement.

The Traylor Type H Jaw Crusher does a heavyweight job.

Even though it is built lighter than machines with heavy cast iron frames, the welded type of construction makes it stronger—a good producer and economical in operation.

Among its outstanding features are:—

—Welded Steel Frame — Scientifically reinforced

—Cast Steel Swing Jaw and Pitman

—Improved Swing Jaw Suspension

—Manganese Steel Curved Jaw Plates

—Fourteen sizes, from which to choose, to fit your needs—8" x 12" to 56" x 72"

There are many other features which make this a unique crusher. Our representative will be glad to call at your convenience to discuss this crusher with you. Write or phone us.

Bulletin No. 2105 also gives further details.

WE BUILD

Rotary Kilns
Rotary Coolers
Rotary Dryers
Rotary Slakers
Scrubbers
Evaporators
Jaw Crushers
Gyratory Crushers
Reduction Crushers
Crushing Rolls
Grinding Mills
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Tube Mills
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Rotary Screens
Elevators

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P. O. Box 550 Place D'Armes Station, Montreal, Canada

Export Department—104 Pearl St., New York City. Foreign Sales Agencies: London, Lima, Rio de Janeiro, Buenos Aires, Santiago, Antofagasta, Oruro, Montevideo, La Paz

The belt that leads a DOUBLE LIFE

BOTH OF THEM PROFITABLE

Users report Lightning belt life up to three times that of smooth belt in the movement of fine material up steep inclines.

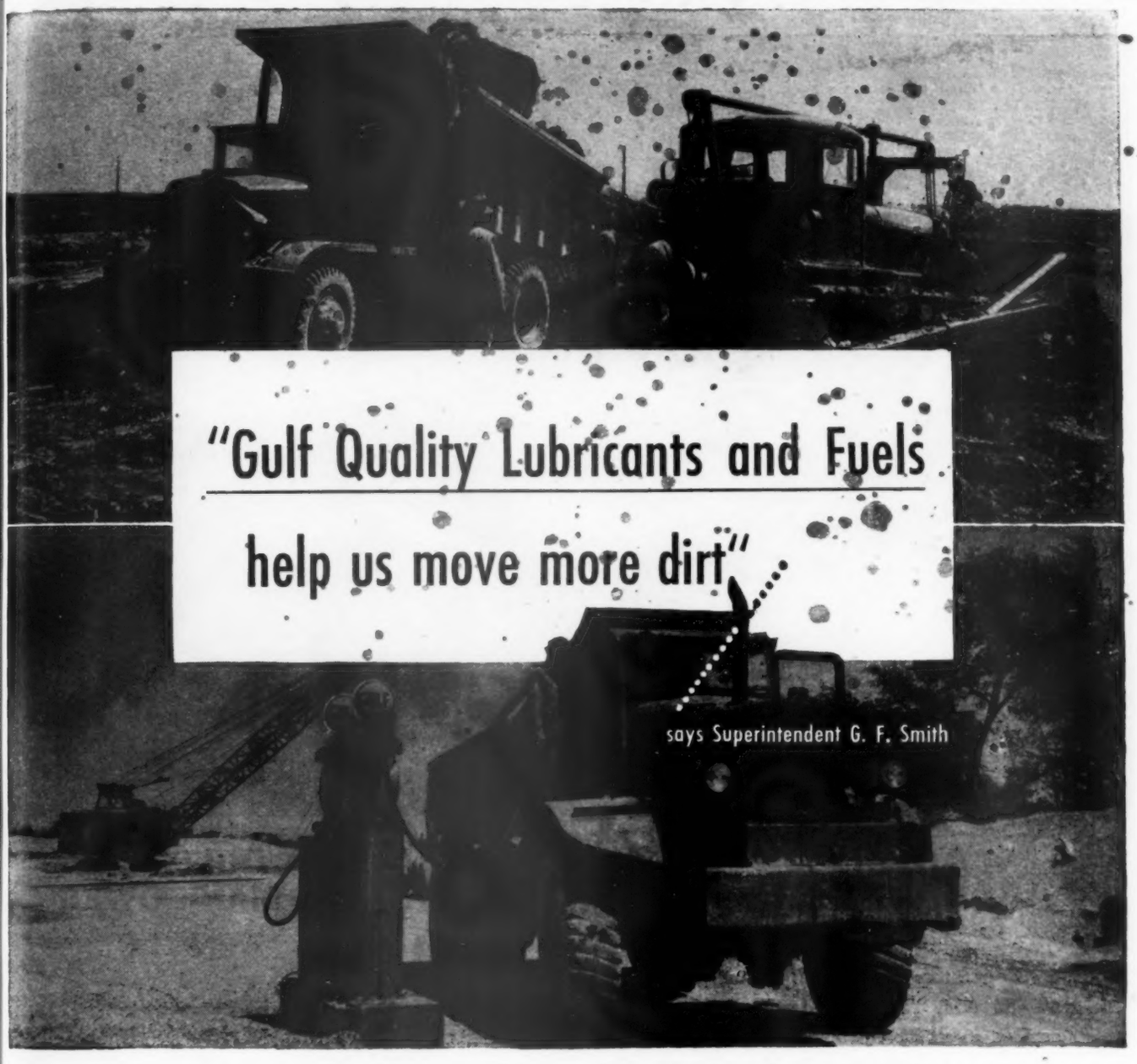
The unusual center rib-construction of Lightning Conveyor Belt grips material...wet or dry...in pocket-like divisions to prevent load slippage.

Elimination of load slippage reduces belt cover wear to the minimum. Belts can run slower to deliver rated tonnage.

When the ribs do finally wear down after long usage, Lightning Conveyor Belt may serve a long second life on flat conveying. Two belts for the price of one, then, is not uncommon to users of Lightning.

Get a grip on loose loads with LIGHTNING RIBBED CONVEYOR BELTS

The AMERICAN RUBBER Mfg. Co.
OAKLAND, CALIFORNIA
MANUFACTURERS OF RUBBER PRODUCTS FOR INDUSTRY



*Buffalo Gravel Corporation, Camp Hill, Pa., has the contract to strip 40 feet of earth covering this quarry at Trenton, Mich. Approximately 600,000 cubic yards of dirt are to be moved. Among the modern equipment employed is the truck shown in the lower photo. With a capacity of 26 cubic yards without sideboards, this is one of the largest trucks built today.

"OUR FORMULA FOR KEEPING EQUIPMENT in good condition is Gulf quality petroleum products plus daily attention," says Superintendent G. F. Smith of the Buffalo Gravel Corporation.* "This formula pays us big dividends—more working hours for equipment, more dirt removed, and lower maintenance costs."

On all types of construction jobs, Gulf quality petroleum products play an important part in keeping equipment rolling on tough schedules and under punishing operating conditions. Gulf lubricants provide greater protection against breakdowns and mechanical troubles — and Gulf motor fuels help contractors get maximum performance from their equipment.

Write, wire, or phone your nearest Gulf office today and arrange to use Gulf higher quality lubricants and fuels on your next job. They are quickly available to you through 1200 warehouses located in 30 states from Maine to New Mexico.

GULF

GULF OIL CORPORATION • GULF REFINING COMPANY

DIVISION SALES OFFICES:

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ST. REGIS VALVE PACK SYSTEMS SAVE DOLLARS AND MAN-POWER

Two operators pack 3,760 lbs. of cement per minute using two four-tube St. Regis Packers and St. Regis Multiwall Valve Paper Bags . . . the bags *custom*-built of St. Regis specification Kraft paper. This production is made possible by the speed of the Packer and the automatic closing of the valve.

The maximum in packaging efficiency and economy and the certain protection of the product in transit and in storage are attained with the St. Regis Valve Pack System. Starting with the making of rugged Kraft paper and carrying through to the manufacturing and installing of Valve Bag Packing Machines, St. Regis Paper Company specialists are thoroughly conversant with every phase of the packaging of rock products. Experienced field engineers are in constant touch with conditions in the field.

St. Regis MULTIWALL PAPER BAGS

MULTIPLY PROTECTION • MULTIPLY SALEABILITY

ST. REGIS PAPER COMPANY

TAGGART CORPORATION

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Birmingham Boston Cleveland Dallas Denver Detroit Franklin, Va.
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IN CANADA:
St. Regis Paper Co. (Can.) Ltd.
Montreal, Quebec
Vancouver, British Columbia

Announcing the New

Norblo

Cement AIR Cooler

This new Norblo product combines air cooling and dust collection, reducing the temperature of cement to 200 degrees or lower. It can also be attached to existing air separators to add cooling of both fines and tailings. With the Norblo Cement Cooler you clean up the entire milling process, get the most advanced cooling wholly by air, whether you use air separators or other methods.

Norblo Cement Cooling is fully patented. It links a revolutionary advance and a long desired solution of one of the thorniest problems in cement mill operation.

●

With the Norblo Automatic Bag Type Collectors, Norblo H. E. L. S. Cyclones and Norblo Hydraulic Collectors, Norblo Exhaust Fans, Norblo equipment for bag cleaning, etc., the addition of Norblo Cement Coolers makes Norblo the most complete line of dust collecting and air handling equipment now available for the cement, lime, gypsum, phosphate and other rock products industries in North and South America.

●

THE NORTHERN BLOWER CO.

6407 BARBERTON AVE., CLEVELAND 2, OHIO

THE POWER THEY PROMISE IS THE POWER THEY DELIVER

CONSIDER this when you want to be sure you have enough crusher power: *The horsepower of "Caterpillar" Diesel Engines is ALL WORKPOWER. Ratings show maximum output—not the momentary peak performance of a power-plant stripped of fan, pump and other necessary accessories.*

CATERPILLAR TRACTOR CO., PEORIA, ILLINOIS

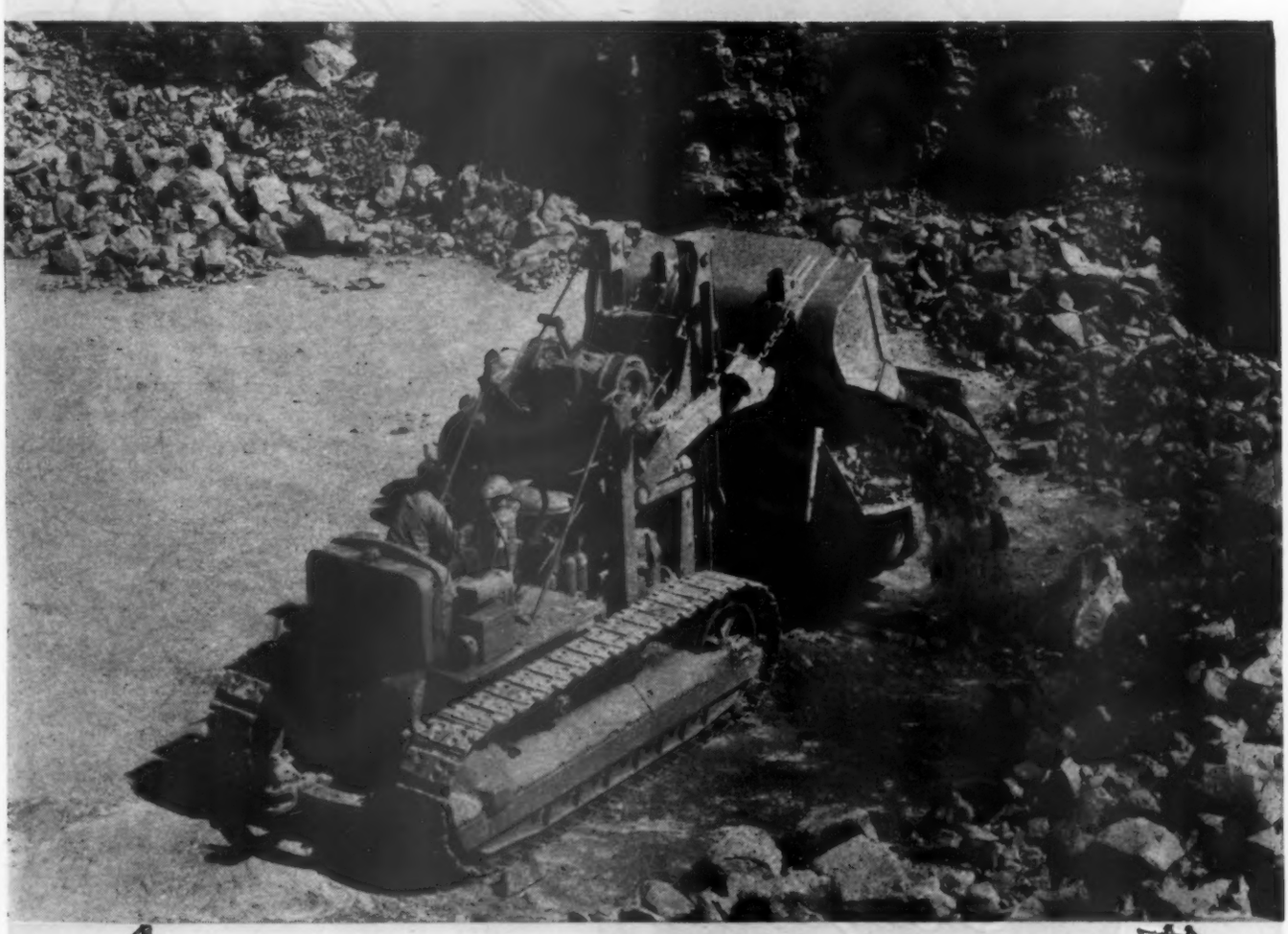
The discharged veteran wears this emblem. Remember his service and honor him.

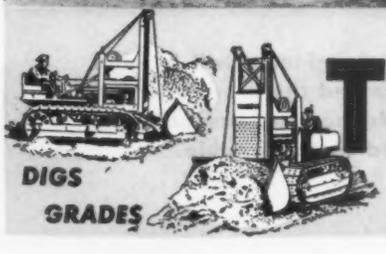
"YOU CAN'T BEAT A 'CATERPILLAR' DIESEL in its weight and horsepower. No other make engine can operate any cheaper," says E. T. Busch, superintendent of this plant crushing extremely hard flint rock boulders. "Filters keep fuel clean as a hound's tooth," he adds.

Good Operators TRAXCAVATE!

IT'S THE MODERN MATERIAL-HANDLING AND EARTH-MOVING METHOD

PUT TRAXCAVATORS to work stripping overburden, loading blasted rock or sand from the pit, and other material handling jobs and watch your production costs drop. These fast-working, highly mobile machines dig big loads with ease, carry them where needed, and dump them into trucks, cars, hoppers, or stockpiles. Perhaps they can help solve manpower and production problems in your pit, quarry, or plant. There is a wide choice of models with bucket capacities from ½ to 2½ cubic yards — TRAXCAVATORS to meet all of your requirements. See your TRACKSON-"Caterpillar" dealer today for the complete story, or write for literature to TRACKSON COMPANY, Dept. PQ-16, Milwaukee 1, Wisconsin.





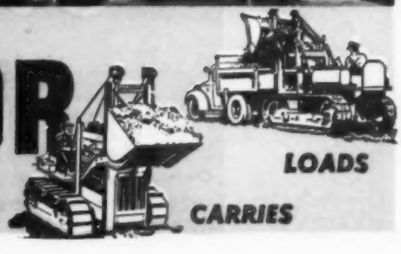
DIGS

GRADES

TRAXCAVATOR

REG. U. S. PAT. OFF.

THE ORIGINAL TRACTOR EXCAVATOR



LOADS

CARRIES

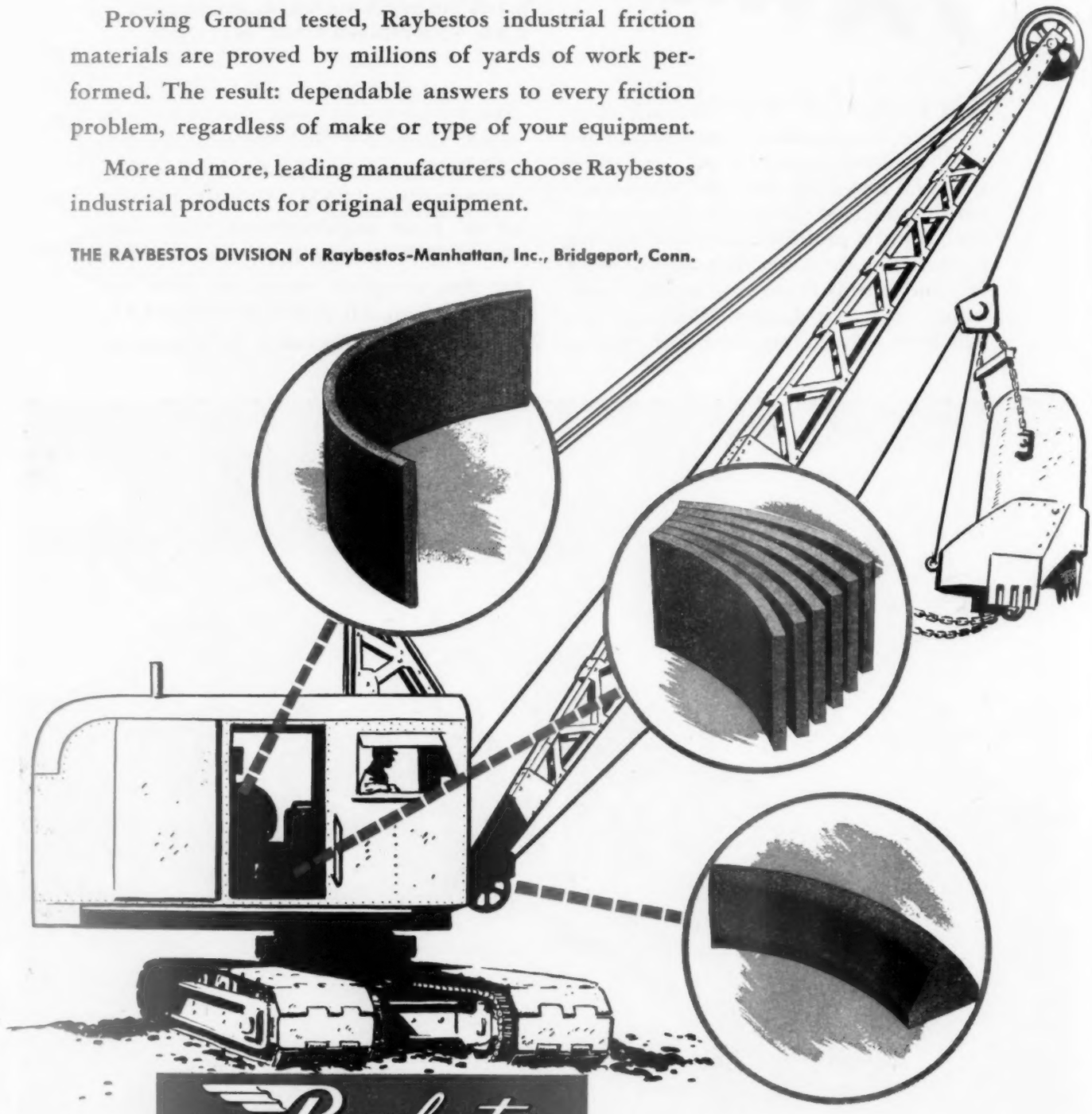
FRICTION CARRIES THE LOAD

Drag... swing... hoist... wherever power passes through friction, Raybestos has the right material to do the job *right.*

Proving Ground tested, Raybestos industrial friction materials are proved by millions of yards of work performed. The result: dependable answers to every friction problem, regardless of make or type of your equipment.

More and more, leading manufacturers choose Raybestos industrial products for original equipment.

THE RAYBESTOS DIVISION of Raybestos-Manhattan, Inc., Bridgeport, Conn.



Raybestos

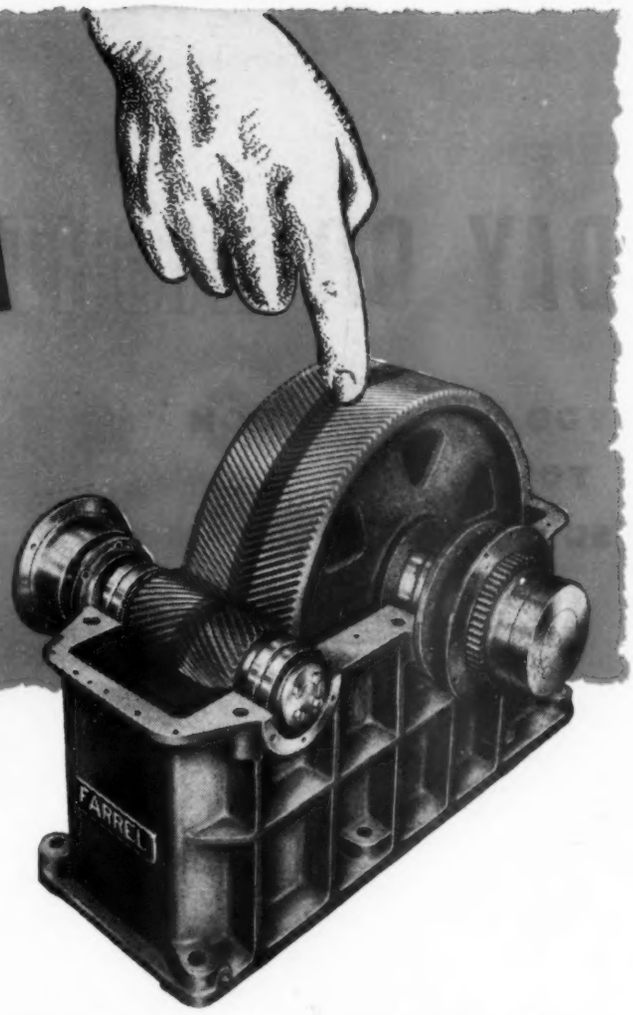
INDUSTRIAL

FRICTION MATERIALS

Only single source of all four friction materials —Full Metallic, Semi-Metallic, Woven and Molded

Raybestos engineers will be glad to recommend the proper friction material for applications that have developed chronic trouble.

You can
put your finger
on the **EXTRA**
LOAD-CARRYING
CAPACITY
in these

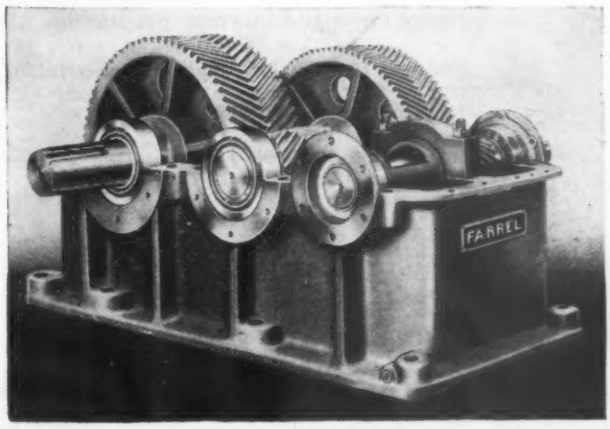


SPEED REDUCERS

ONE look at the continuous tooth herringbone gears in a Farrel Speed Reducer tells you what gives these gears their extra strength and load-carrying capacity.

In place of the center groove found in some herringbone gears, you see the extra tooth area formed where the helices meet to make the teeth continuous across the face. This extra tooth area is known as the *backbone.* It puts the entire width of the gear to work, providing greater capacity to withstand shocks, stresses and heavy loads.

Precision generated by the famous Farrel-Sykes process, the *Gear with a Backbone* is widely known throughout industry for its smooth, quiet, efficient operation. Its combined characteristics of overlap or interlacing of the teeth, gradual engagement and inclined line of pressure distribute the load on the teeth uniformly, reducing wear and maintaining correct tooth action through a long gear life.



Other features which contribute to smooth, efficient power transmission in Farrel Speed Reducers include rigid and accurately ground shafts properly mounted in roller bearings, and heavy section cases that hold rotating elements in precise alignment.

These speed reducing units are available in a complete range of sizes for any capacity. Ratios of single reduction units range from 1½:1 to 10:1, double reduction units up to 60:1, and triple reduction units up to 180:1. Write for descriptive Catalog No. 438.

FARREL-BIRMINGHAM COMPANY, INC.
344 Vulcan St., Buffalo, N. Y.
Plants: Ansonia, Derby and Stonington, Conn., Buffalo, N. Y.
Sales Offices: Ansonia, Buffalo, New York, Pittsburgh, Akron, Los Angeles, Tulsa, Houston, Charlotte.

FB-283

FARREL
The Gear with a Backbone

Farrel-Birmingham

DAY OR NIGHT

YOU CAN COUNT ON YOUR INDUSTRIAL SUPPLY SPECIALIST

WHATEVER your need . . . whenever you need it, your Industrial Supply Specialist will bring you the products and materials you require to keep production rolling. When quality air hose is needed, he will suggest Hewitt *Monarch*. This Job-Engineered, top-quality hose is designed for the most severe air tool and compressor service. For general purpose needs, your Industrial Supply Specialist will recommend *Ajax* air hose. This hose has established enviable records for pneumatic tool operations in all types of industry. And when economy is paramount, he will suggest *Conservo*. You can count on this man to help you decrease maintenance costs and increase production.

•

Specify Hewitt for quality industrial rubber products. Phone the Hewitt distributor listed in the Classified Section of your telephone directory . . . or write to the Hewitt Rubber Corporation, 240 Kensington Avenue, Buffalo 5, N. Y.

HEWITT RUBBER
of Buffalo
Job-Engineered Industrial Hose • Belts • Molded Goods

QUALITY RUBBER PRODUCTS FOR INDUSTRY FOR 86 YEARS

PRINT IN BINDING

INVESTIGATE TOURNAPULL ECONOMIES FOR YOUR STRIPPING OPERATIONS

THE equipment investment for a three-unit, 15-yd. Tournapull fleet, with snatch loading 113 HP crawler tractor equipped with dozer for road maintenance and Rooter for breaking up hard material, is less than half that for a shovel-truck combination of equal load and haul capacity. Four men operate this complete Tournapull stripping outfit. With a dump boss and foreman you have a six-man crew.

Output capacity per eight hour shift at 85% operating efficiency (50 minute hour) on an average 1000 foot level one-way haul would be 3120 yards bank measure (see table below). Operating life of Tournapulls is usually figured at 10,000 hours . . . there are many units well over this figure.

Maintenance is exceptionally low . . . dual tire troubles are eliminated . . . there is none of the spring maintenance that runs up costs. Complicated waste motion (and wear) of shovel-to-truck loading is saved, there is no waiting at shovel . . . each Tournapull is a complete operating unit. Service and breakdown delays are localized to one unit . . . rest of fleet goes right on working.

OUTPUT FOR FLEET OF THREE TOURNAPULLS

50 minute hour operating efficiency. Level haul on good mine roads. Loading average scraper material. Bank measure.

Length of haul (one way)	400′	600′	800′	1000′
Yds. per hour.	480	450	420	390
Yds. per 8 hours.	3,840	3,600	3,350	3,120
Yds. per 24 hours.	10,400	9,450	8,820	8,190

On 24 hour production, 3 hours allowed for maintenance. For longer hauls, figure at 14 m.p.h.

See your LeTourneau distributor and let him arrange to have our field engineers study your open pit properties and suggest a layout for Tournapulls with output and cost estimates.

This United Clay Mine, Kaolin Mine in Georgia, formerly stripped by dragline and trucks, was easily adapted to Tournapull excavation when Wm. Anderson was awarded stripping contract for 50,000 yards.

Tournapulls work from the surface down, can uncover the ore in strips or sections, dump in off-seam areas, or in mined-out cuts.

Tournapulls travel on level road at top speed of 14.9 m.p.h. Big tires (5′6″ diameter), powerful engine (150 h.p.), effective weight distribution for high traction, long wheelbase . . . provide fast cycles over mine roads, good hill climbing ability, beat trucks for all weather operation. CM4m

ufacturers of Tournapulls, Angledozers, Bulldozers, Tiltdozers, ryall Scrapers, Power Control Units, Rooters, Tournatrailers, rnacranes, Tournatrucks, Sheep's Foot Rollers, Tournarope, rnaweld, Tournalifts.

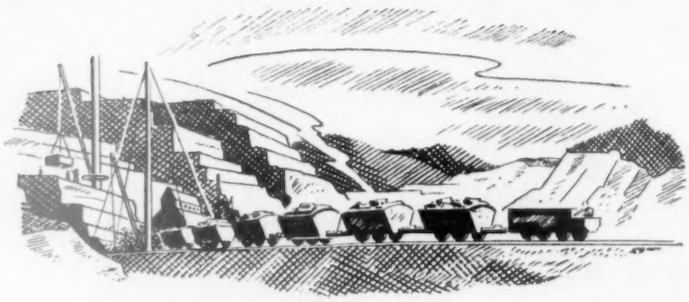
Trade Mark Reg. U. S. Pat. Off.

LETOURNEAU

PEORIA, ILLINOIS • STOCKTON, CALIFORNIA

NDING

Here's the reason why you get



More tons per cable

WITH RISING COSTS on every hand it is more and more important for management to reduce costs through longer lasting equipment. Cable particularly demands purchasing judgment, since failure not only involves premature replacement, but, more important, seriously curtails production. Anaconda Wire & Cable Company, Subsidiary of Anaconda Copper Mining Company, 25 Broadway, New York 4, N. Y. Sales Offices in Principal Cities.

40293

NOTE THESE BIG FEATURES FOR LONG, TROUBLE-FREE WEAR!

EXTRA RESISTANCE—Tough Neoprene flame-resistant jacket—also tear resistant because of Seine twine reinforcing.

NO TWISTING—Herringbone compensating construction allows freer movement of copper conductor.

ADDED SAFETY—Special high dielectric fillers between conductors prevent shorting under tension or compression, lend added strength and *safely* prolong life of cable.

ANACONDA *Securityflex* CABLE

ANACONDA

The EAGLE *Line* of High-Efficiency Rock Reduction and Loading Machines

EAGLE Pulverizer used by Marble City Quarries Company, Columbus, Ohio. Produces 35 to 40 tons of agricultural lime per hour.

EAGLE Impact Breaker and Pulverizer, adjustable to produce both agstone and commercial stone. Has electric-welded one-piece steel frame.

EAGLE Jaw Crusher. Strong, rigid construction. Reversible jaws and cheek plates. Easy accessibility. Capacities up to 540 tons per day.

The super-performance of EAGLE Crushing, Screening and Loading Equipment represents many years of experience and development work in the field of rock breaking and handling.

These high-efficiency, heavy-duty machines are the standard equipment of many large-scale producers of crushed stone who rely upon EAGLE machines in meeting all market demands.

Whether the ultimate product is agricultural limestone, roadstone, or general construction aggregates, EAGLE owners are prepared to match any competition in delivering high quantity and quality at rock-bottom cost.

EAGLE Truck Mounted Loader. A rugged, high-speed machine. Loads gravel, stone, etc., up to 3 tons per minute. Self-powering and self-feeding. One-man operated.

Write for Bulletins

EAGLE CRUSHER CO., INC.

GALION, OHIO

Today-

Your *Standard*
GATES VULCO ROPES

Are Giving BETTER SERVICE

Than *ANY* V-Belts Ever Built Before!

To meet the needs of our Army's tanks, tractors and self-propelled big guns in combat service, it was necessary to develop V-Belts far superior to any that had ever been built before. Gates developed and built these greatly superior V-BELTS—and here is why this fact is important to you:--

Here is the reason

Every improvement developed by Gates for these Army V-BELTS has been added, day by day, to the quality of the standard Gates Vulco Ropes which have been delivered to you.

This is one of the very few instances in which improvements developed primarily for military use could be passed on immediately to you. Ordinarily, you would have had to wait. But in the case of Gates V-belts it was clearly recognized that industry simply had to have the best V-belts that could be made in order to maintain the production volume that was essential to winning the war.

That is why Gates has been able to pass on to you, day by day, every V-belt improvement developed for our armed forces during the war—and that is why your Standard Gates Vulco Ropes are today outperforming any V-belts ever built before!

All Gates V-Belts are Built With

The Patented **CONCAVE SIDE**

Gates

THE MARK OF SPECIALIZED RESEARCH

THE GATES RUBBER COMPANY

Engineering Offices and Jobber Stocks in All Large Industrial Centers

461

GATES VULCO ROPE DRIVES

CHICAGO 6, ILL., 549 West Washington. NEW YORK CITY 3, 215-219 Fourth Avenue. ATLANTA 3, GA., 521 C. & S. Nat'l Bank Bldg.
LOS ANGELES 21, CAL., 2240 E. Washington Blvd. DENVER 17, COLO., 999 S. Broadway. DETROIT 2, MICH. 223 Boulevard Bldg.
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UNIT 1020

for the TOUGH *jobs*

10 TON CRANE

Consider these exclusive features *not* found in any other comparable crane or shovel:

- New style full vision cab.
- Gasoline engine mounted in straight line with main machinery.
- Drop-forged alloy steel gears and splined shafts.
- Automatic traction brakes . . . no manual control required.
- One-piece cast gear case, simple in design and built as carefully as the finest automotive transmission . . . dust proof and oil tight.

Compare its low cost and economical operation with any other machine.

FULL VISION CAB
Complete 360 degree visibility at all times. Promotes safety. Increases job efficiency.

Convertible **TO ALL ATTACHMENTS**
• SHOVEL • CLAMSHELL • DRAGLINE
• TRENCHOE • MAGNET • PILE DRIVER

3/4 YARD SHOVEL

CONTACT FACTORY DIRECT
FOR PRICE AND DELIVERY

UNIT CRANE & SHOVEL CORP. — **MILWAUKEE 14, WISCONSIN, U.S.A.**

A4848-1PC-R2

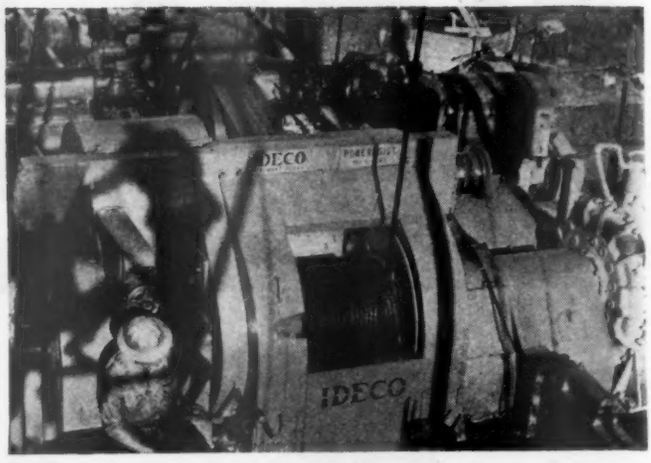
THE CLUTCH THAT STOPPED CLUTCH TROUBLE

Here is the one truly modern clutch for all heavy duty industrial drives.

It controls power and torque through a cushion of air —with as firm a grip or as light a grip as the job requires. It has no springs, arms, levers or toggles—requires *no* lubrication and little maintenance.

It is the Fawick Airflex Clutch—proved for superior performance and economy—in hundreds of industrial applications and in thousands of Diesel-driven Navy ships.

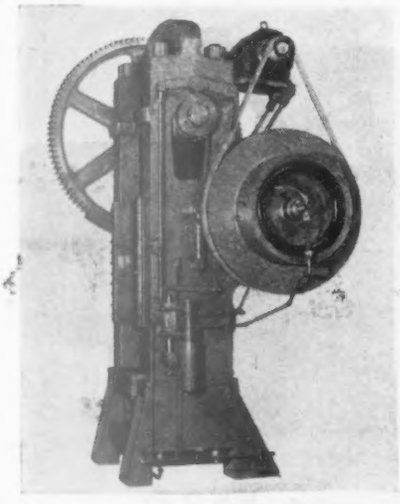
Let us help you engineer clutch trouble *out* of your machines. Book on request.



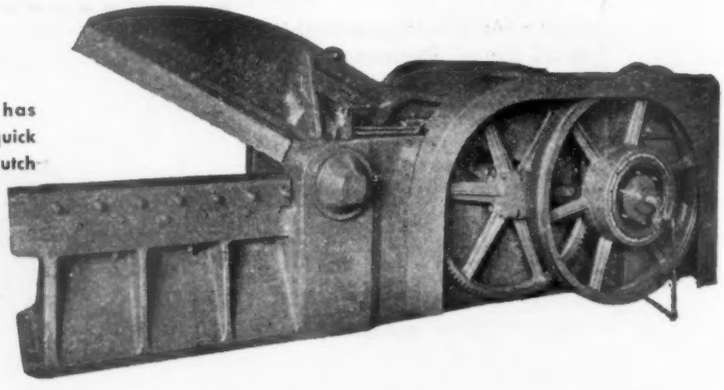
Oil-well drilling rig—equipped with 11 Fawick Clutches.

▲ Modern power shovel gives full-time operation through dependable Fawick Clutches.

Steel rolling mill Fawick-equipped for smooth, even power.



◀ Heavy duty press has smooth starts and quick stops with Fawick Clutch and Brake.

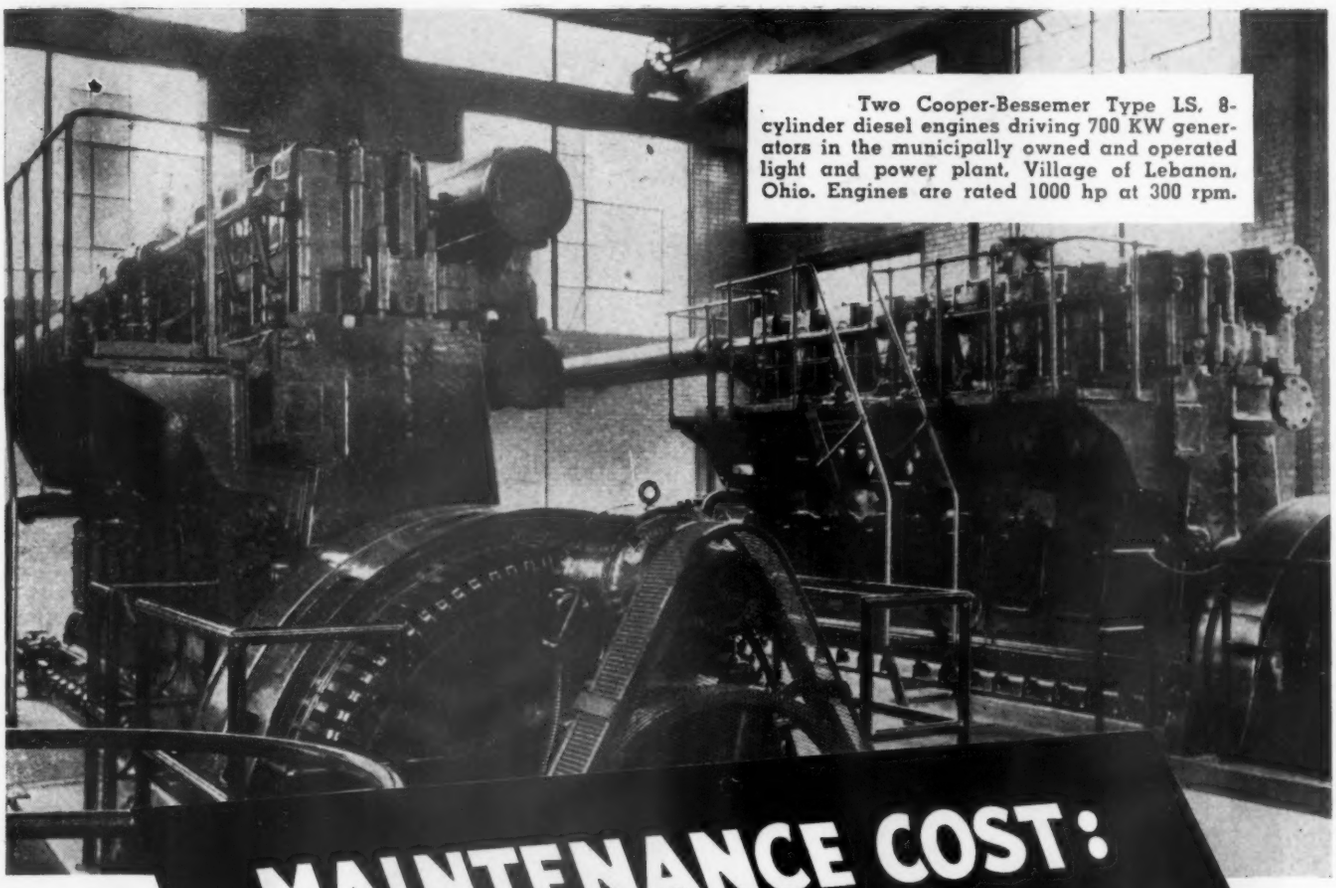


▶ Alligator shear operates through Fawick Clutch and Brake.

ARMY-NAVY "E"

FAWICK *Airflex* CLUTCH

FAWICK AIRFLEX CO., INC. - 9919 Clinton Road, Cleveland 11, Ohio



Two Cooper-Bessemer Type LS, 8-cylinder diesel engines driving 700 KW generators in the municipally owned and operated light and power plant, Village of Lebanon, Ohio. Engines are rated 1000 hp at 300 rpm.

MAINTENANCE COST: less than 1% per year

THESE two Cooper-Bessemer diesels powering the Lebanon, Ohio, municipal power and light plant have been in continual service since November, 1941. Maintenance cost is averaging less than 1 percent of engine cost per year. Here is a typical example of the maintenance economy demonstrated time and again in Cooper-Bessemer installations.

How about operating economy and efficiency? Mr. L. F. Wertz, Lebanon's capable plant superintendent, says, "Our fuel bill runs less than ½ cent per KW generated. Last month lube oil consumption cost us only .015 cents per KW. Bonds issued to finance our new plant are being retired much faster than originally estimated due to the earnings made possible by the efficiency of our Cooper-Bessemer Diesels." Mr. Wertz might also tell you that power is delivered at a highly competitive rate and that village-consumed power, valued at $12,000 per year, is furnished free.

Modern, long-lived Cooper-Bessemer diesels are available in sizes and types for virtually all heavy-duty requirements, stationary or mobile. Contact the nearest Cooper-Bessemer office for complete details.

THE Cooper-Bessemer CORPORATION
Mt. Vernon, Ohio • Grove City, Pa.

New York, Washington, Gloucester, Dallas, Houston, St. Louis, Los Angeles, Seattle, San Francisco, and the Calmes Engineering Company, New Orleans, La.

BUILDERS OF DEPENDABLE ENGINES FOR 112 YEARS

EASTON
Phoenix
PATENTED

. . . . the finest body ever built for shovel-loaded rock and ore

Practically INDESTRUCTIBLE

On several operations the original EASTON PHOENIX cars have been in steady service for more than twenty years. Their owners will tell you that these old cars, battered and stained by age and hard usage, are hauling as much rock and ore today as ever. Constant heavy pounding of tons of shovel-loaded rock will leave a brutal mark on any container. But, where there are no moving parts (nothing but simple, rugged body strength) you can look forward to years of unfailing service long after the original paint has weathered away. Today, with modern design and engineering principles developed through years of field study, the famous EASTON PHOENIX is made better than ever.

PUT IT IN AN EASTON PHOENIX SIDE-DUMP, DOORLESS CONTAINER

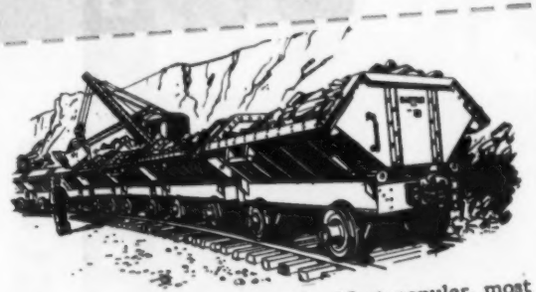
LOADABILITY: What goes on under your shovel dippers? The rugged, doorless EASTON PHOENIX container laughs at the roughest kind of treatment from the biggest rock your dippers can handle. No moving parts to cause trouble — no room for damage through warping. Designed for maximum width to provide the biggest possible target for your shovels. Top speed can be maintained throughout the entire loading operation.

DUMPABILITY: Side dumping means straight line operation — faster spotting and quicker take-offs at the dumping point. EASTON PHOENIX design assures complete, controlled feeding of every load. The dumping body is balanced on a new double-trunnion hinge to put gravity-return-action right to work at the highest point of elevation. Again, nothing to go wrong — no hang-ups in the body — not a second nor a penny wasted from beginning to end of the dumping cycle.

HAULABILITY: EASTON PHOENIX containers meet every requirement in the normal practise of handling rock and ore between your shovels and your fixed dumping point. EASTON PHOENIX cars, trailers or truck bodies are adaptable, respectively, to any make of locomotive, tractor or truck chassis. To shoot and load where you want to, when you want to, start your haulage plan with PHOENIX containers.

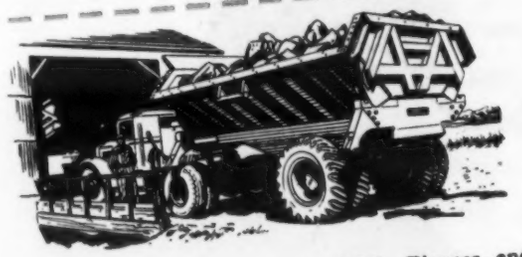
* * *

EASTON PHOENIX capacities range from 10 to 30 tons (and special EASTON bodies are limited only by the size and capacity of your shovel dippers and hoppers). Now, to get the modern haulage facts on your haulage problem, write for your copy of the new EASTON Transportation Statement, Form 176. Address: Engineering Counsel, Easton Car & Construction Company, Easton, Pa.



EASTON PHOENIX CARS—Most popular, most efficient rock and ore handling car in its field. Giving top performance on hundreds of installations throughout the world. The EASTON PHOENIX car provided the original testing ground for the PHOENIX container.

EASTON PHOENIX BODIES—One of the first back-mounted bodies to be used in rock hauling service. While still giving top performance on special applications, the back-mounted PHOENIX truck body has been generally superseded by EASTON PHOENIX trailers.



EASTON PHOENIX TRAILERS—Pioneer and unquestioned leader of the trend toward trailer haulage in rock and ore handling operations. EASTON TRAILERS are available with standard EASTON PHOENIX bodies up to 30 tons capacity, or with special container designs.

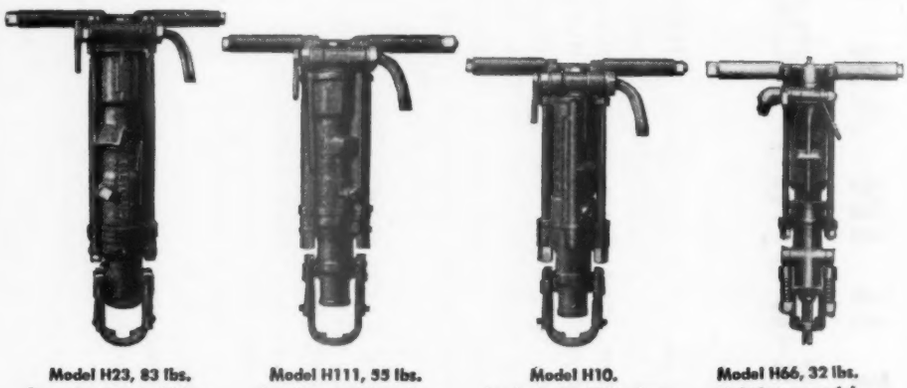
B-1020

Cleveland Sinkers

PACK A MIGHTY WALLOP!

In addition to their remarkable power, Cleveland Sinkers are easily-held and very economical in air consumption. Many sizes, in wet or dry collaring, for fast drilling in every type of rock. Available with chucks for collared drill steel, and plain or lugged shanks. Drop forged construction insures super strength. End-seating valve (used on most models) improves with use, prevents greater air consumption as drill grows older. • Mountings available for Models H111 and H10 for conversion to drifter type drills, used on column, arm or tripod. • Be sure to use these sinkers with the Cleveland Accessories shown here. *Remember, the most efficient rock drill delivers even better performance when equipped with the proper, high-quality accessories.*

Write for Bulletin 122 on Sinkers—Bulletin AC-11 on Accessories



Model H23, 83 lbs. For extra tough drilling.

Model H111, 55 lbs. An all around favorite.

Model H10. Leader in the 45 lb. class.

Model H66, 32 lbs. Light but powerful.

FOR BEST RESULTS USE

CLEVELAND ACCESSORIES

"Veribest" Air Hose is extra tough, withstands rough treatment.

Cleveland Air Filters prevent fine trash from entering your drill.

Cleveland Line Oiler keeps drills amply lubricated and working at top speed.

Hose Clamp Tool is handy and efficient for securing wire clamps to hose and fittings.

Type "A" Couplings are made of a tough, rust-proof, bronze alloy. Quick-acting.

LEADERS IN DRILLING EQUIPMENT

CLEVELAND ROCK DRILL DIVISION
THE CLEVELAND PNEUMATIC TOOL CO.
CABLE ADDRESS: "ROCKDRILL"
CLEVELAND 5, OHIO

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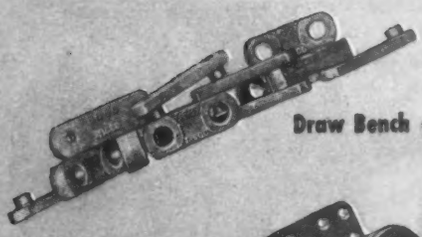
Use THE CHAIN THAT OUTWEARS ALL OTHERS!

TISCO
HADFIELDS Manganese Steel CHAIN

FOR CONVEYORS, ELEVATORS, DRIVES, ETC.

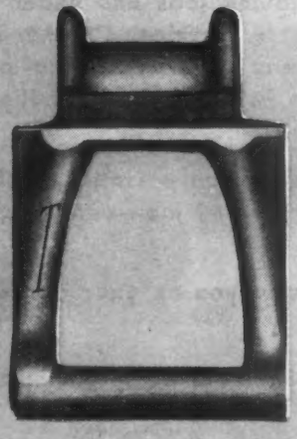


Draw Bench

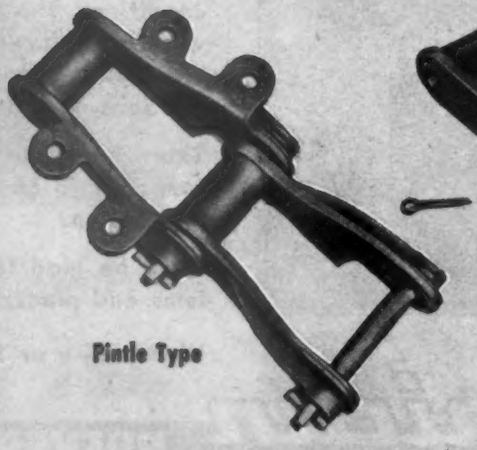
Sand and Gravel Dredge

●Users of TISCO Manganese Steel Chain in quarrying, mining, coking and other industries where chain is subjected to severe abrasion and impact are getting many times greater life from TISCO. The reason is, TISCO toughens where other chains weaken—at the wearing points. TISCO builds up a dense, tough wearing surface of high Brinell hardness under repeated blows. This is due to the cold work-hardening properties of Hadfields Manganese Steel—introduced in America by Taylor-Wharton Iron & Steel Company. Each TISCO chain is tested under a load 50% greater than the recommended working load.

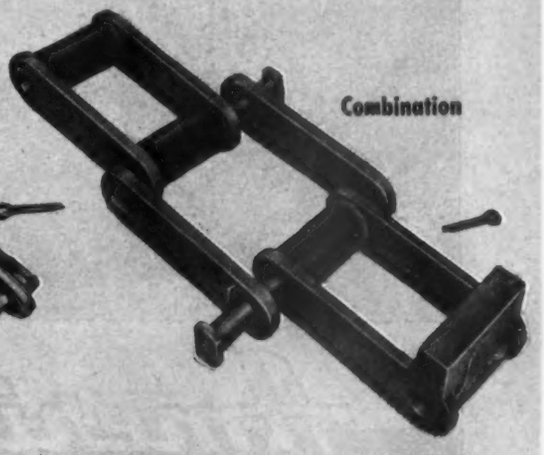
Write today for descriptive data and prices of TISCO Manganese Steel Chain. State type of chain and class of service. *Order now for early delivery.*



Detachable Link



Pintle Type



Combination

Taylor-Wharton Iron and Steel Co.

HIGH BRIDGE, NEW JERSEY • EASTON, PENNSYLVANIA

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INDING

AGSTONE OR ROADSTONE—AMERICANS GIVE YOU THAT FLEXIBILITY YOU NEED

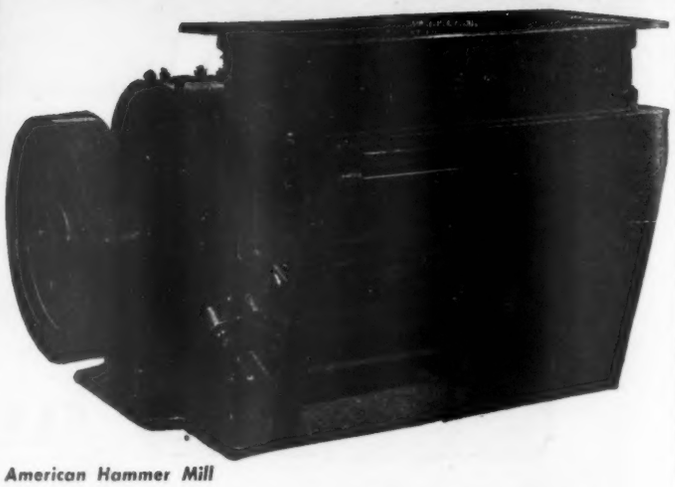
Fixed Plant or Portable Operation—there's a custom-built American to Fit the job

American Hammer Mills and Hammer type Crushers are ideally suited to give high tonnage production in plant or quarry locations with extreme flexibility to suit your seasonal demand. Their heavy-duty sectional construction permits easy dissembly and reassembly for changes of location.

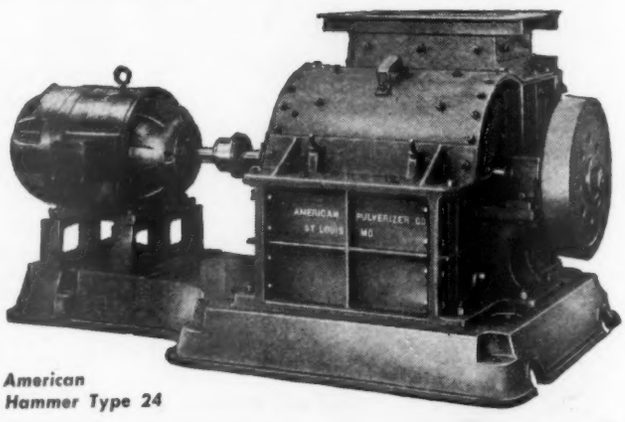
Easy exterior adjustments and easy accessibility for screen changes makes them especially suited to a flexible operation. American's wide range of reduction and high capacities in all sizes of screenings provide an efficient low cost operation in one-step reduction or primary-secondary crushing operations.

Your operation is only as flexible as your crushers — Americans offer that flexibility.

Capacities from 10 to 100 TPH.

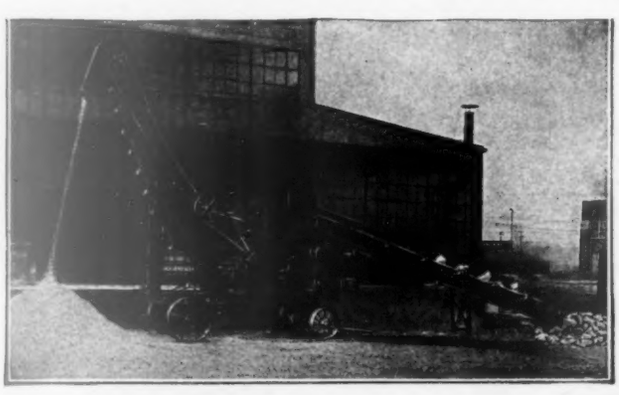


American Hammer Mill



American Hammer Type 24

Extreme Portability with Dependable, High Tonnage Reduction



American Hammer Mills are built to give high tonnage even on fast-moving jobs and under extreme conditions. The Portable American Crusher and conveyor unit shown here is a one-step operation reducing one-man stone to ¾" aggregate at the rate of 300 tons per day.

There is a type of American portable crusher, custom-built to go *right to any job*—and give efficient production.

We'll be glad to advise you on your crusher problems and plans.

Write, wire or telephone for complete information.

American PULVERIZER COMPANY

Originators and Manufacturers of Ring Crushers and Pulverizers

1059 MACKLIND AVE.
ST. LOUIS 10, MO.

NOW.....

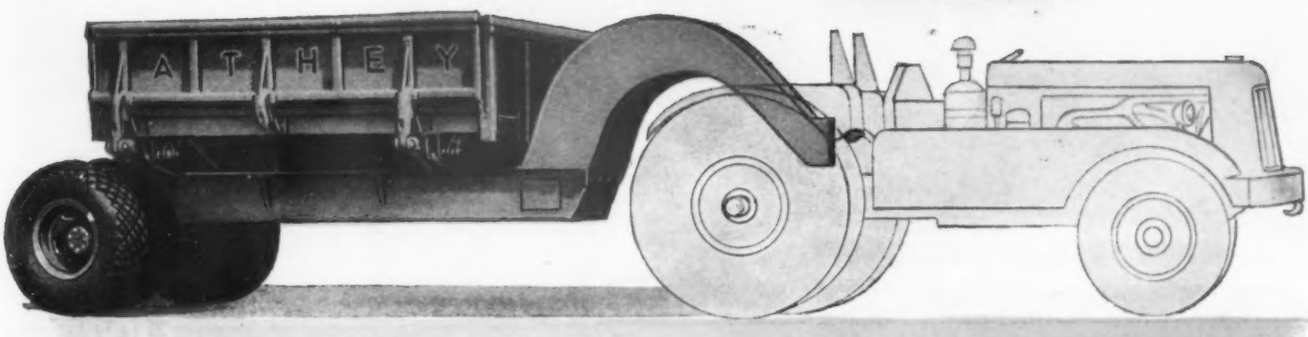
Athey Trailers

APCOR

RIDE ON RUBBER!

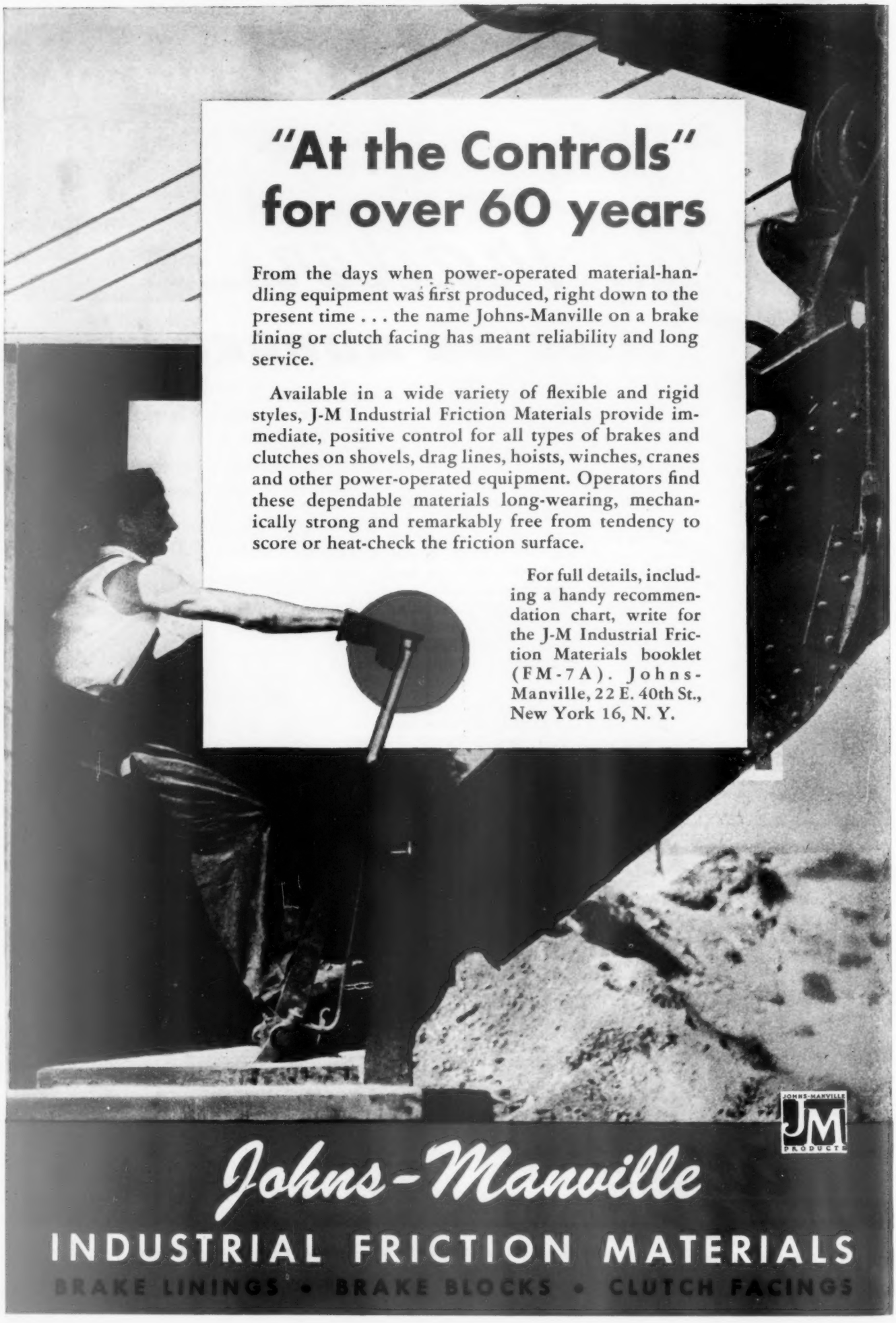
Since 1922, Athey has built a complete line of trailers and wagons, establishing a world-wide reputation for dependable equipment. Now, with its experienced engineering skill and manufacturing background in the trailer field, Athey announces a heavy-duty, 2-way dump trailer *on rubber tires.* Matched with the "Caterpillar" DW10 Rubber-tired Tractor in capacity and strength, the new PD-10 Trailer has such features as: fast, positive hydraulic control; 10 cubic yard capacity; discharge to either side; sturdy, long-life design and construction. Find out more details about the new PD-10 Trailer. Your Athey-"Caterpillar" Dealer can give you full facts or you're invited to write direct to ATHEY PRODUCTS CORPORATION, 5631 W. 65th Street, Chicago 38, Illinois

2-WAY DUMP — POSITIVE, HYDRAULIC CONTROLS
The new Athey PD-10 is 2-way dump — a money-saving advantage on many types of jobs; has fast-acting, positive hydraulic controls.



Athey APCOR

DEPENDABLE LOADING & HAULING EQUIPMENT



"At the Controls" for over 60 years

From the days when power-operated material-handling equipment was first produced, right down to the present time . . . the name Johns-Manville on a brake lining or clutch facing has meant reliability and long service.

Available in a wide variety of flexible and rigid styles, J-M Industrial Friction Materials provide immediate, positive control for all types of brakes and clutches on shovels, drag lines, hoists, winches, cranes and other power-operated equipment. Operators find these dependable materials long-wearing, mechanically strong and remarkably free from tendency to score or heat-check the friction surface.

For full details, including a handy recommendation chart, write for the J-M Industrial Friction Materials booklet (FM-7A). Johns-Manville, 22 E. 40th St., New York 16, N. Y.

JOHNS-MANVILLE JM PRODUCTS

Johns-Manville

INDUSTRIAL FRICTION MATERIALS

BRAKE LININGS • BRAKE BLOCKS • CLUTCH FACINGS

MACHINERY FOR
CEMENT—LIME—ORES

F. L. SMIDTH & CO. Manufacture the following Complete Line of Modern Machinery for Cement, Lime and Allied Materials, the Sintering of Ores, etc.

UNIDAN multi-compartment grinding mill.
UNIKOM multi-compartment grinding mill.
KOMINUTER for wet and dry grinding.
BALLMILL for granulating.
TUBEMILL for wet and dry pulverizing.
TRIX for grading wet granulated material.
TIRAX MILL for drying and grinding.
ATOX, air swept, vertical shaft pulverizer.
PYRATOR for drying and grinding.
SPRAY CASINGS for pulverizers.
CYLPEBS metallic grinding bodies.
DRAGPEB metal lining for pulverizers.
SILEX flint liners for pulverizers.
FLINT PEBBLES for pulverizers.
AIR SEPARATORS and Cyclones.
AGITATORS for mixing and storing wet mix.
AIR DISTRIBUTORS for slurry tanks.
WASHMILL for disintegrating and mixing materials in water.

ROTARY KILNS for cement, lime, ores, etc.
UNAX KILNS, with integral cooler.
SUCTION GRATE ROTARY KILN.
ROTARY KILNS—Sintering and roasting.
PRE-HEATERS for rotary kilns.
UNAX COOLERS, cooling drums on kiln.
UNAX GRATE COOLER, air quenching.
COOLERS, rotary pressure coolers.
UNAX PRE-COOLER.
F.L.S. MULTI-TUBE ROTARY COOLER.
F.L.S. INCLINED GRATE COOLER.
COOLERS, Cement, Ores, etc.
CHAIN SYSTEM for wet kilns.
HEAT EXCHANGERS for dry kilns.
KILN CONTROL, electrical.
GAS ANALYZER, electrical.
KILN EQUIPMENT, fans, hoods, dampers, spouts, airseals, dust chambers, multiple gas discharge.

FLUXO PACKER for filling bags.
FLUXO PUMP for pneumatic transport.
EXBINER for discharging bulk cement.
EXTRACTORS, cement from silos.
SKIPULTER shaker conveyor.
CYLCUP distributing conveyor.
PNEUMATIC FEEDERS.
SLURRY FEEDERS for kilns and mills.
CRADLE FEEDERS for coal, rock, clinker.
TABLE FEEDERS for coal, rock, clinker.
COAL FEEDERS for rotary kilns.
COAL BURNERS for rotary kilns.
GAS BURNERS for rotary kilns.
OIL BURNING EQUIPMENT for kilns.
SYMETRO Drive, speed reduction units.
LENIX short center belt drive.
PUMPS for heavy liquids as cement slurry.
FLOURMETER for determining micron sizes in finely ground cement, etc.

PLANT ENGINEERING

F. L. Smidth & Co. are also engineer specialists in designing and equipping factories for making Portland cement and other allied materials, having devoted their efforts along these lines for a period of over fifty years.

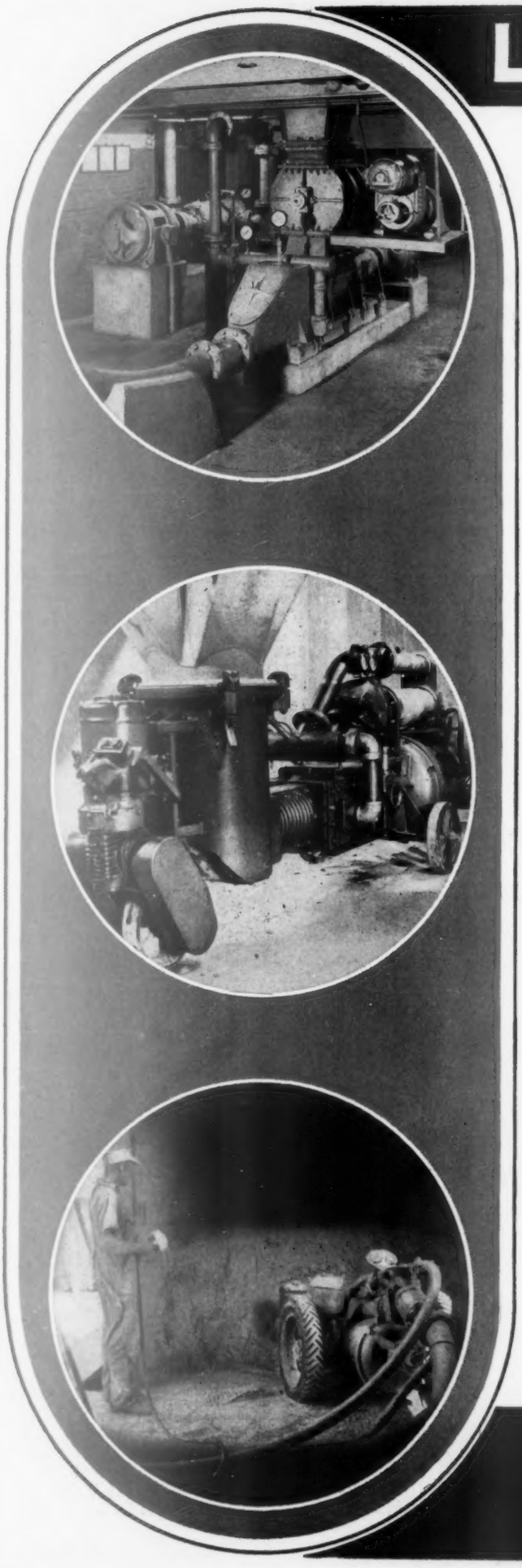
Their engineering services include all stages of the project from the preliminary investigation of the site and raw material deposits, chemical and physical tests of the raw materials and finished product, to all necessary drawings and specifications for erecting and equipping all departments of the plant, including also the electrical engineering.

POST WAR MODERNIZATION

This service applies equally well to complete new plants or any special department of a plant—to revisions or conversions of existing plants—making standard Portland cement, slag cements, white cement, or for making special high early strength cements, such as "VELO."

F. L. SMIDTH & CO.

11 WEST 42nd STREET **NEW YORK 18, N. Y.**



Looking Ahead

Fuller Company has endeavored to anticipate, as closely as possible, equipment requirements of the cement industry's post-war modernization plans. We have just completed the erection of a new plate shop, which addition to our production facilities will enable us, better than ever before, to fulfill our obligations to the cement and other rock products industries.

We know of no better way to modernize than to install Fuller equipment wherever possible . . . equipment that has been tried and proved throughout the years right in your own industry; equipment designed and built by men who have grown up in the industry and know its peculiar problems and requirements.

This, we feel, is borne out by the hundreds of installations by Fuller in the industry. Practically every cement plant in the United States, and many in foreign countries, use Fuller equipment. In fact, many companies have standardized on Fuller equipment.

Conveyors, coolers, (clinker and cement), compressors, vacuum pumps, feeders, material level indicators, gate valves, aeration units . . . when you need them, you need Fuller. Tell us your problems . . . chances are we can help.

Fuller-Kinyon Conveying Systems

These systems offer unusual economies in transporting pulverized materials through pipe lines. It permits freedom of plant layout and location such as cannot be secured by any other.

STATIONARY PUMP: This pump is generally used for conveying from pulverizers, collector screws, bins, silos and hopper-bottom cars. Also for loading and unloading cars, ships and barges. Built for various capacities to 300 tons per hour. Systems have conveyed as far as 5000 ft., elevations to 500 feet.

PORTABLE PUMPS: These pumps operate on the same principle as the stationary type, have many uses, but generally employed for conveying from silos. Built in two distinctly different types. One type travels on tracks, moved from one point of discharge to another together with its motor. The other type is known as the trackless-portable, and can also be moved under its own power, from one point to another; installed principally to replace obsolete mechanical conveyors under bins and silos.

REMOTE-CONTROL UNLOADER: For conveying bulk cement from flat-bottom storage bins

FULLER
CATASAUQUA
CHICAGO—120 SO. LASALLE ST.
WASHINGTON, D. C.

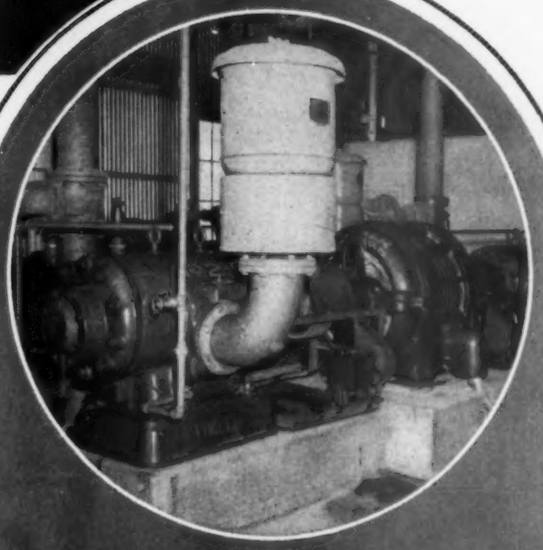
with FULLER

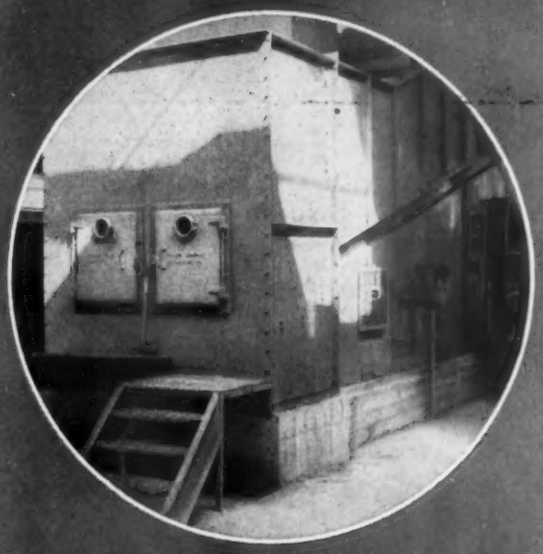
and silos to packer bins, box and hopper-bottom cars. Also for unloading cement from box cars, ships and barges.

ROTARY COMPRESSORS AND VACUUM PUMPS: Adopted by the industry for "spotting" units in various departments . . . air where and when needed to do the work required most efficiently and economically. Some plants use Fuller Rotaries exclusively. Built in single and two-stage for capacities to 3300 c.f.m., 125-lb. pressure. Vacuum pumps for vacuums to 29.90-in. (referred to 30-in. barometer). Compact, comparatively light in weight, smoothness in operation, are a few of the many advantages offered by these machines.

AIR-QUENCHING INCLINED-GRATE COOLER: Designed and built principally for production of cement clinker of high glass content, to reduce delayed expansion and to obtain other advantages characteristic of high glass-content clinker, with efficient recovery of heat and economical complete cooling as inherent features. A three-purpose cooler—abrupt air-quenching, heat recuperation and final cooling. Also used for cooling lime, ores and dolomite.

DRY PULVERIZED-MATERIAL COOLER: For the efficient cooling of finished Portland cement previous to being conveyed to storage. Water is used as a cooling medium. Temperature drops ranging from 100 to 150-deg. Fahr., depending on initial temperature of material and water, have been obtained in actual plant operation. This cooler also used in the chemical-process industry for cooling other dry pulverized materials.



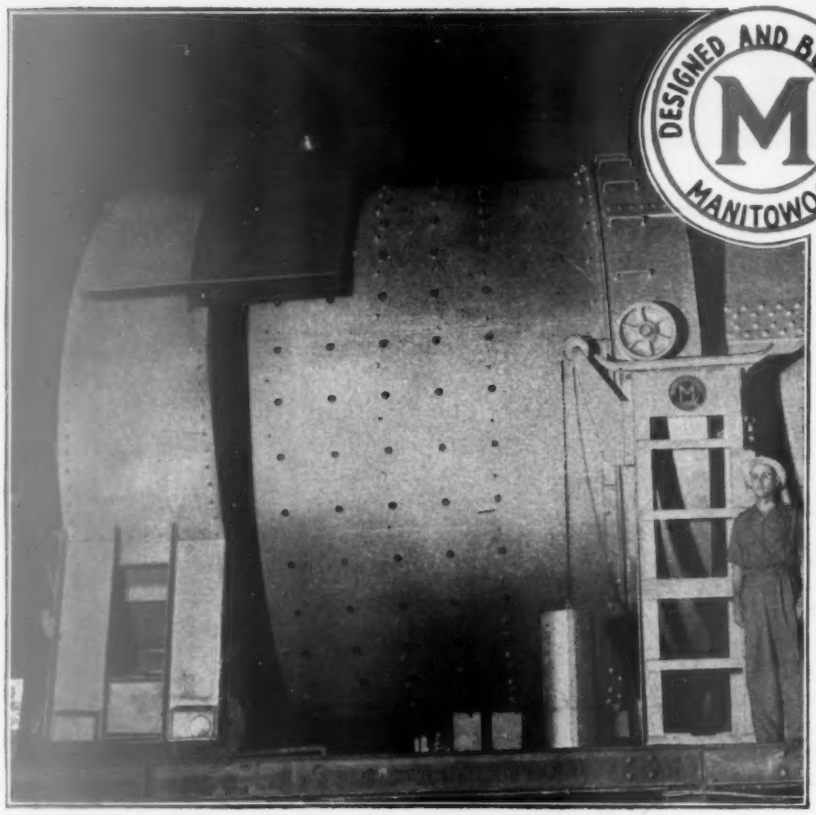


WE ALSO BUILD

THE AIRVEYOR CONVEYING SYSTEM
ROTARY FEEDERS
ROTARY GATE VALVES
MATERIAL-LEVEL INDICATORS
MOTION SAFETY SWITCH
AERATION UNITS
SLURRY VALVES
SAMPLERS

COMPANY
PENNSYLVANIA
SAN FRANCISCO—CHANCERY BLDG.
—COLORADO BLDG.

G-40T



Vanderwerp Type S Recuperator applied to Unit Fired Rotary Cement Kiln 11 ft. x 400 ft.
(Repeat Order)

3 *Outstanding* DEVELOPMENTS TO REDUCE PRODUCTION COSTS

1. VANDERWERP RECUPERATOR for rotary kilns insures immediate quenching and maximum heat recovery.

2. MINOGUE SLURRY AGITATOR provides thorough agitation and blending with minimum power and air consumption.

3. MINOGUE KILN FEEDER—The only practical device for introducing flue dust in dry state.

The wide acceptance of the Vanderwerp Recuperator in the United States has led to important installations in South America, Australia and the Philippines.

The demand for units of high capacity has resulted in our Type S design suited to kilns of maximum output. In all cases the Recuperator may be readily attached to an existing kiln, requiring the minimum of labor in erection, involving no foundations or brickwork and occupying minimum floor space.

MANITOWOC ENGINEERING WORKS

GENERAL OFFICES AND PLANT
Manitowoc, Wisconsin

Division of
Manitowoc Ship Building Company

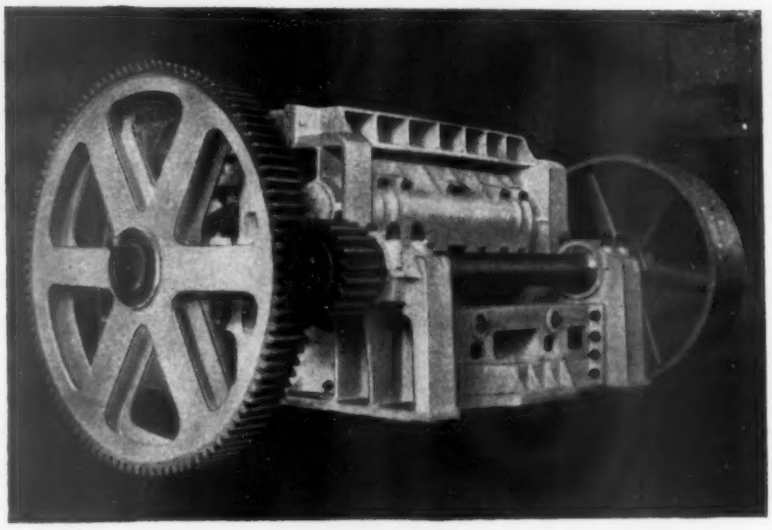
CHICAGO OFFICE
131 E. Wacker Drive

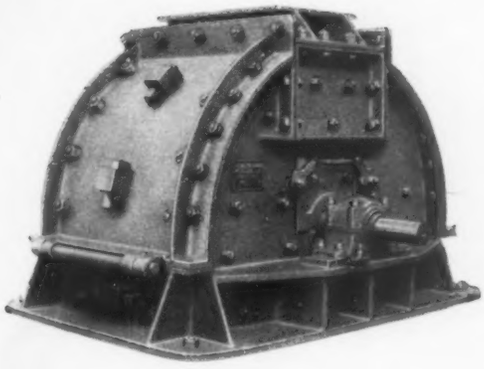
"PENNSYLVANIA"

PENN-LEHIGH *STEELBUILT* PRIMARY CRUSHER

Massively *STEELBUILT* with wide reduction ratios, PENN-LEHIGH Primary Single Rolls do heavy duty, non-clog crushing of large Steam Shovel Cement-making Materials, Limestone, Gypsum and Industrial Minerals, — (dry or wet)—year after year with unfailing dependability.

Six (6) sizes. Capacity range 200 to 1000 tons per hour.





"PENNSYLVANIA" REVERSIBLE IMPACTOR

This advanced type, powerfully *STEELBUILT* for heavy duty, makes secondary and finer reductions of Cement-making Materials and Industrial Minerals, by smashing head-on impact, without cage attrition.

REVERSIBILITY, —alternate right and left-hand operation assures symmetrical wear and maximum life for Impacters and Anvils, and the ultimate in simplicity and accessibility, — at minimum maintenance cost.

Eight (8) sizes. Capacity range 25 to 500 tons hourly.

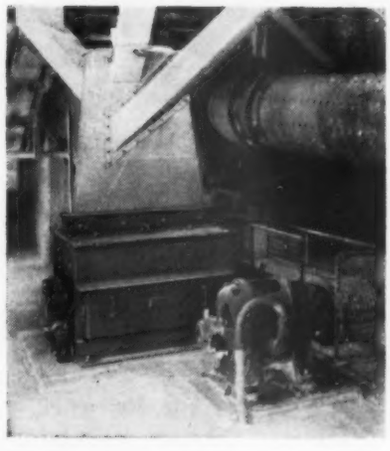
"PENNSYLVANIA" REVERSIBLE HAMMERMILLS

Specialized for the preparation of Agricultural Limestone at minimum production cost, operators investigating this rapidly growing Industry, will find "Pennsylvania" STEEL-BUILT REVERSIBLES doing yeoman service, because,—

Major reduction is made by smashing impact,—Hammers are automatically turned and resharpened, and Cage Bars automatically resharpened,—Power demand reduced,—and Overall maintenance cost sharply cut.

Fifteen (15) sizes meet the requirements of large, medium and small Plants.

Send us your specifications, and our Engineers will co-operate with equipment and layout recommendations.



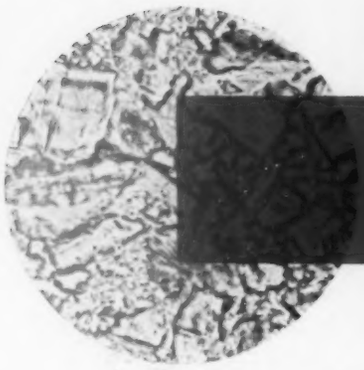
Forty years experience—at your service.

17th Floor, Liberty Trust Bldg.
Philadelphia 7, Pa.

PENNSYLVANIA CRUSHER COMPANY

Pittsburgh, Chicago, Birmingham, Los Angeles. Associated with Fraser & Chalmers Engineering Works, LONDON

STEELBUILT CRUSHERS



From Coarse Commercial Grinding . . .

For Wide Range Pulverizing

From a Few Hundred Pounds per Hour

THE Raymond line of pulverizing and separating machinery . . . developed over a half a century . . . adequately serves the many and varied requirements of the non-metallic minerals industry.

Whatever your problem, there is a type and size of Raymond Mill to fit your production needs . . . Screen Mills, Impact Mills, Roller Mills, Bowl Mills . . . any fineness up to 99.99% passing 400-mesh . . . and capacities up to 40 tons or more per hour of uniform finished material.

This double-duty unit . . . equipped with flash drying . . . provides an efficient method of handling various clays, such as fire clay, kaolin, sagger and ball clays. The material comes to the mill, containing 20% to 25% moisture. This is reduced to a desired percentage during the grinding process at an unusually low cost of production.

This is designed especially for direct-firing . . . not merely adapted to that purpose from some other field. Therefore the Raymond Bowl Mill contributes to maximum kiln efficiency through uniformity of coal grinding, as well as economy in operation and maintenance. It has shown overall savings in plants where powdered coal has replaced natural gas or fuel oil installations. See Catalog No. 43.

Write for Catalogs for further particulars.

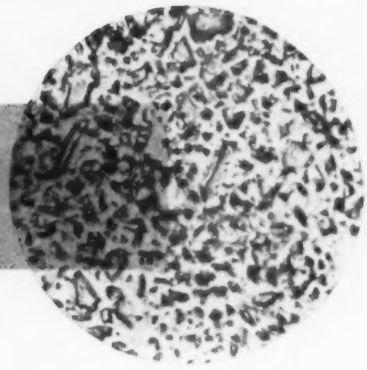
RAYMOND COMBUSTION

Sales Offices in Principal Cities

Canada: Combustion Engineering Corp., Ltd., Montreal

. . . to Superfine Micron Sizes

Depend on RAYMOND Mills



up to 40 Tons per Hour—

Where the raw material comes to the mill containing moisture, the Raymond flash drying system may be used to reduce the moisture content to any desired percentage, while grinding the product to specified fineness. This method combines two operations in one, eliminating separate dryers, and resulting in greatly increased mill capacity. Certain products may be cleaned of foreign particles by means of throw-out attachments on the mills for automatically rejecting impurities.

↑ Equipped with double whizzer separator, this modern Roller Mill gives unusually high capacities at high fineness. Used for the economical reduction of burnt lime, dolomite, agstone and limestone fillers . . . and many other fine grinding applications in the non-metallic minerals field. See Catalog No. 51.

← The standard Roller Mill of the rock materials industry for commercial grinding operations in the 20 to 100-mesh fineness range. It is a low-cost producer of pulverized phosphate rock, limestone, gypsum, clays, marble chips, barytes and similar materials. Refer to Catalog No. 34.

PULVERIZER DIVISION
ENGINEERING COMPANY, INC.
1321 North Branch Street, Chicago 22, Illinois

SINCE 1887

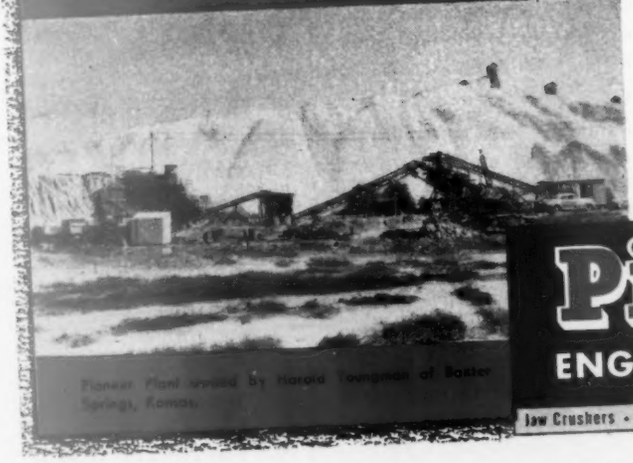
CRUSHING FLINTROCK

ONE OF THE HARDEST AND MOST ABRASIVE ROCKS IN THE WORLD

with PIONEER EQUIPMENT

Flintrock boulders, near Joplin, Mo. equalled in abrasiveness by only one known South African rock deposit.

Pioneer No. 56 Primary Crusher Unit—Traveling Grizzly Feeder and 2436 Primary Jaw Crusher.



Pioneer Plant owned by Harold Youngman of Baxter Springs, Kansas.

● This is one of those interesting jobs that men who make their living in pit and quarry enjoy reading. It begins with the Santa Fe railroad which has recently installed new high-speed trains on its main line west of Kansas City. It was found that limestone ballast did not stand up under severe service.

Chats, which are rejects from lead and zinc mines near Joplin, Mo., were available, but their size was minus 3/8" and too fine for ballasting the main line for high-speed trains.

Also available were great piles of flintrock which the mine operators had rejected as uncrushable. The mining section of W.P.B. advised that this rock was the most abrasive known in the U. S. and equalled only by one known rock deposit in the world located in South Africa.

Harold Youngman of Baxter Springs, Kansas, took the contract to crush this flintrock to 1½" minus. The following PIONEER equipment is doing the job:

- a PIONEER No. 56 Primary Crusher, which consists of a Grizzly feeder and a 2436 Primary Jaw Crusher
- a PIONEER 1536 intermediate jaw crusher
- a PIONEER 48-V plant which includes a 1036 jaw crusher, a 40" x 22" roll crusher and a 4' x 12' vibrator screen.

Because of the extreme abrasiveness of the rock, it was found that better results could be obtained by using the four crushers and closing down the top opening on the jaw crushers, thus reducing the angle between the jaws and increasing the manganese life several times.

PUT IT UP TO PIONEER

You may never have a job like Mr. Youngman's, but whatever your job you'll want Pioneer equipment—the dependable equipment built with extra margins of performance for extra profits.

Pioneer
ENGINEERING WORKS

Jaw Crushers • Roll Crushers • Screens • Conveyors • Feeders • Washers

ENGINEERS and MANUFACTURERS of QUARRY-GRAVEL AND MINING MACHINERY

MINNEAPOLIS 13, MINN

Starting Its 21ST YEAR on This Job!

When the National Mortar & Supply Co., Gibsonburg, Ohio, purchased this 14-ton, gear drive Plymouth gasoline locomotive back in 1925, it was intended for use in a quarry, handling heavy loads on short hauls. For more than 20 years, it's been doing that job, and has been handling plenty of "extra" work, like car-switching.

This outstanding performance record is the reason why National has added several other Plymouths to its fleet since 1925. And it's the reason why you can look with assurance to Plymouth for the answer to your industrial transportation problem. Plymouth design, materials and craftsmanship combine to provide more tonnage at less cost.

TRACK HAULAGE IS CHEAPER HAULAGE

PLYMOUTH LOCOMOTIVES

GASOLINE, DIESEL MECHANICAL AND DIESEL ELECTRIC

PLYMOUTH LOCOMOTIVE WORKS • Division of The Fate-Root-Heath Co., Plymouth, Ohio, U.S.A.

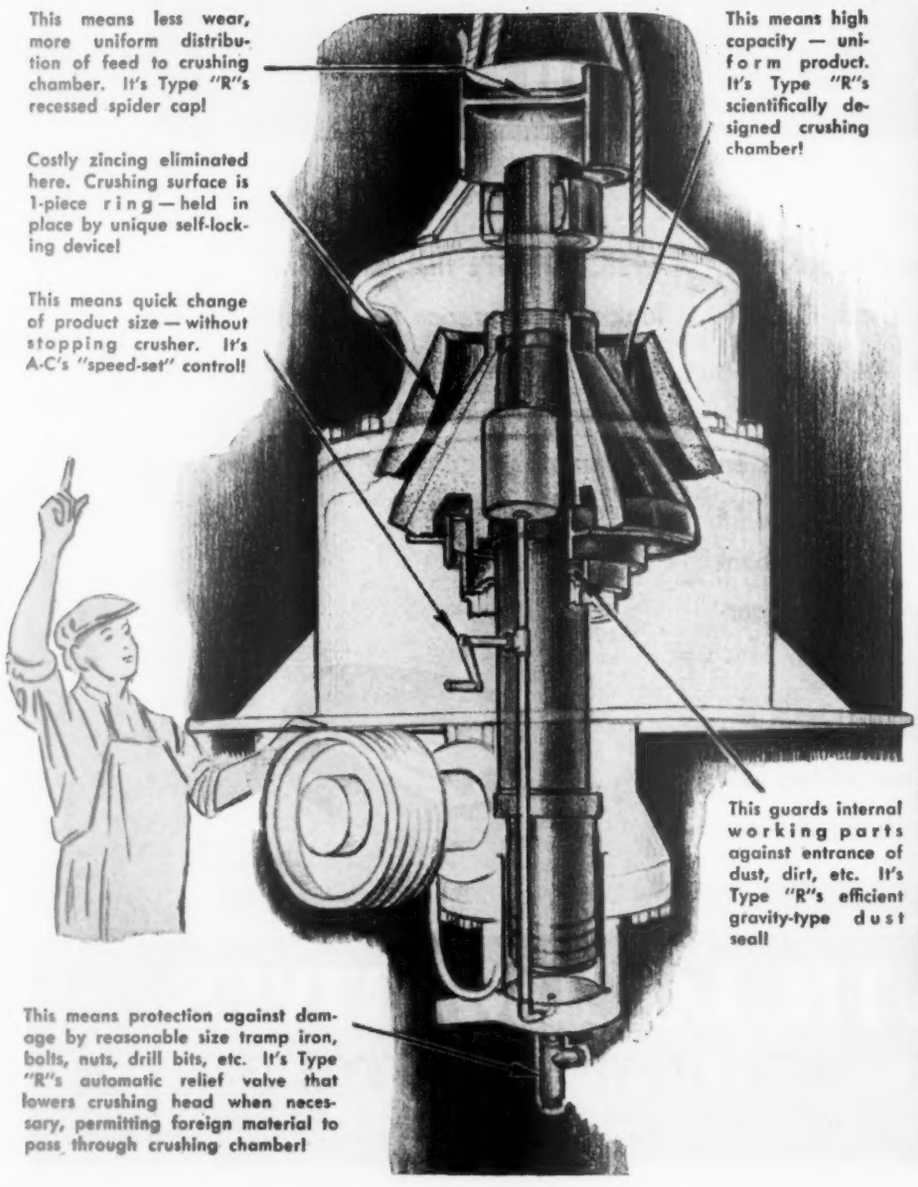
Need Capacity?

A-C'S TYPE "R" SECONDARY CRUSHER GIVES YOU HIGH CAPACITY, CLOSER CONTROL, A MORE UNIFORM PRODUCT —AT A LOWER COST PER TON!

This means less wear, more uniform distribution of feed to crushing chamber. It's Type "R"s recessed spider cap!

Costly zincing eliminated here. Crushing surface is 1-piece ring — held in place by unique self-locking device!

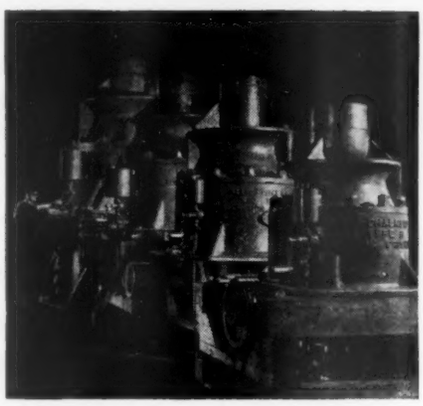
This means quick change of product size — without stopping crusher. It's A-C's "speed-set" control!



This means high capacity — uniform product. It's Type "R"s scientifically designed crushing chamber!

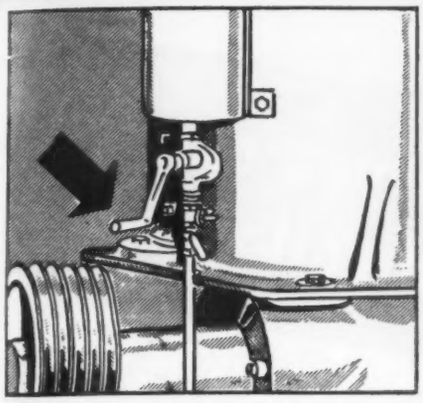
This guards internal working parts against entrance of dust, dirt, etc. It's Type "R"s efficient gravity-type dust seal!

This means protection against damage by reasonable size tramp iron, bolts, nuts, drill bits, etc. It's Type "R"s automatic relief valve that lowers crushing head when necessary, permitting foreign material to pass through crushing chamber!



1 Want *proof?* Compare it with *any other crusher* in same price range. At a given setting, Type "R" will give you a *more uniform* product, *greater capacity* of size of product you require!

2 All wearing parts are heat-treated manganese steel. Their non-choking, uniform wear design permits close setting — enables production of fine stone or excellent ball mill feed.

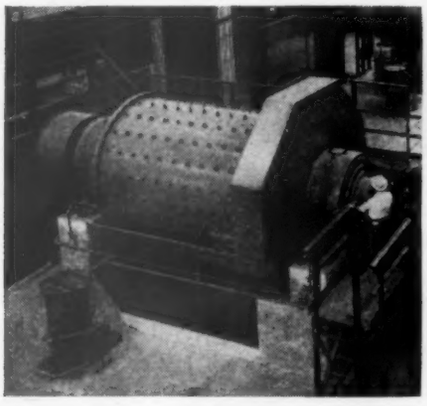


3 Exclusive A-C "speed-set" control permits *quick* change of product size — at simple, almost effortless *turn of crank*. Result: close product control, fast unloading in case of emergency!

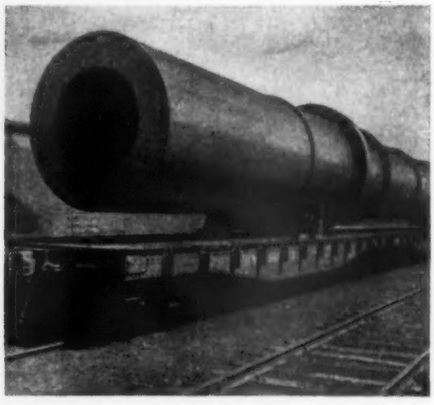
4 Before it can go out to do a job for you, every Type "R" crusher is *assembled and shop-tested* . . . checked for crusher movement; head clearances; oil circulation, temperatures, etc.

5 Best of all, you can buy easy-to-install and operate, low-maintenance, modern Type "R" crushers for *same or less money* than comparable crushers! Want more details? Send for B6006B

6 Got a screening problem? Perhaps A-C's modern "Ripl-Flo" or one of *seven other different* screens we build, can solve it! Yes, in every line A-C gives you wide choice! For example . . .



7 A-C builds *world's largest line* of single and multi-stage grinding mills—ball, rod, pebble, "compeb" and "ballpeb" types. Over 3700 mills now operating all over the world is an A-C record!



8 No, not "long tom" but an A-C rotary kiln. Products being treated in large quantities, at low cost in A-C kilns include cement, lime, ores, oxides, varied synthetic materials, etc.

A-C "TEAMS-UP" MACHINES AND POWER!

. . . builds not only basic *processing* machinery, but also the equipment to *run* it! Yes, Allis-Chalmers offers you power generation, distribution and control equipment—motors, pumps, blowers, compressors, Texrope V-belt drives—builds over 1600 *different* products for *you!*

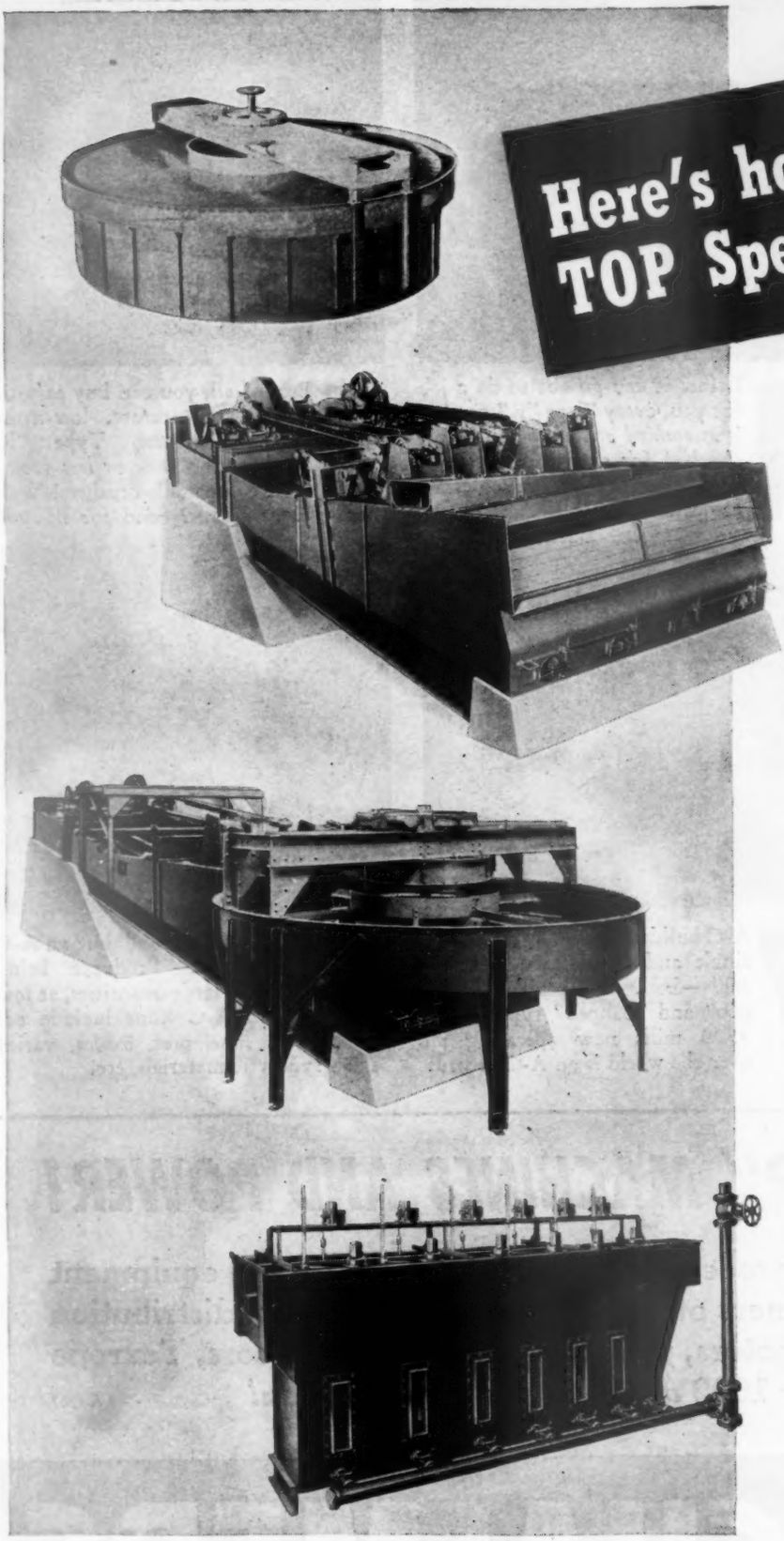
A 1967

ALLIS-CHALMERS

PRODUCER OF THE WORLD'S LARGEST LINE OF MAJOR INDUSTRIAL EQUIPMENT!

MILWAUKEE, WISCONSIN

HEAR THE BOSTON SYMPHONY: *Every Saturday Evening, American Broadcasting Co.*



Here's how you can get TOP Specification Sand

When job requirements demand a uniform and special size, grade, or type of sand . . . when sand of a special quality is essential for particular purposes . . . when only sand that meets certain exacting specifications will be acceptable . . . then you need the efficient processing equipment developed by DORR Engineers from their years of experience doing pioneer work in this and similar fields.

THE DORRCO SYSTEM is designed to meet the needs of both large and small sand and gravel beds. Equipment using the smaller DORR units may be installed for commercial sand and gravel operations of 25 tons an hour and they will process with the same high standard of performance as the larger DORR units which are used in bigger operations handling up to 3,000 tons per hour.

Plan NOW to make low grade sand and gravel beds yield top specification sands of all types and uniform sizes by using the various combinations of DORR equipment. A DORR Engineer will be glad to explain what the DORR System will do and how it will work under your own particular conditions.

Write for—*"Making Prescription Sand at 50 tons an Hour"*—it will be mailed promptly to you, upon request.

OST-7723

DORR

RESEARCH ENGINEERING EQUIPMENT

ADDRESS ALL INQUIRIES TO OUR NEAREST OFFICE

DORRCO

THE DORR COMPANY, ENGINEERS

NEW YORK 22, N. Y. . . 570 LEXINGTON AVE.
ATLANTA 3, GA. . . WILLIAM-OLIVER BLDG.
TORONTO 1, ONT. . . . 80 RICHMOND ST. W.
CHICAGO 1, ILL. . . . . 221 NO. LA SALLE ST.
DENVER 2, COLO. . . . . COOPER BUILDING
LOS ANGELES 14, CAL. . . . 811 WEST 7TH ST.

RESEARCH AND TESTING LABORATORIES
WESTPORT, CONN.

SUGAR PROCESSING
PETREE & DORR DIVISION
570 LEXINGTON AVE., NEW YORK 22

Salute to THE CEMENT INDUSTRY

During 1944-45, Union Pacific paid tribute to American industry on its radio program "Your America", broadcast each week over a nation-wide network. Representatives of 70 major industries were given the opportunity to present the dramatic story of their respective industry's contribution to the welfare of the nation.

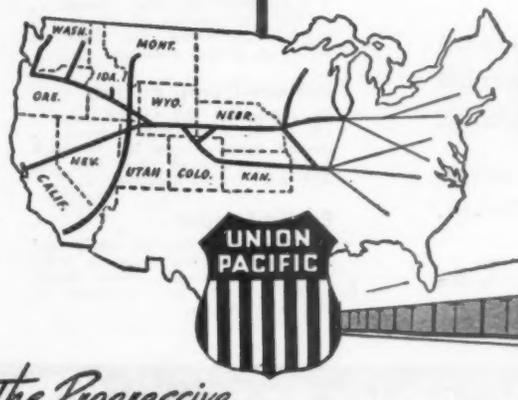
For example, on one program our guest speaker, Frank T. Sheets of Chicago, represented the Portland Cement Association.

Union Pacific—along with other railroads—was then engaged in moving vital wartime materials. Your industry and the nation generally knows what a tremendous task that was and how efficiently it was accomplished.

Today, Union Pacific is prepared to continue its assistance to your industry by speeding the distribution of peacetime commodities. Equipment, facilities and personnel are geared to provide unexcelled service.

A staff of trained traffic men stand ready at all times to cooperate with you.

For fast, dependable service . . . .



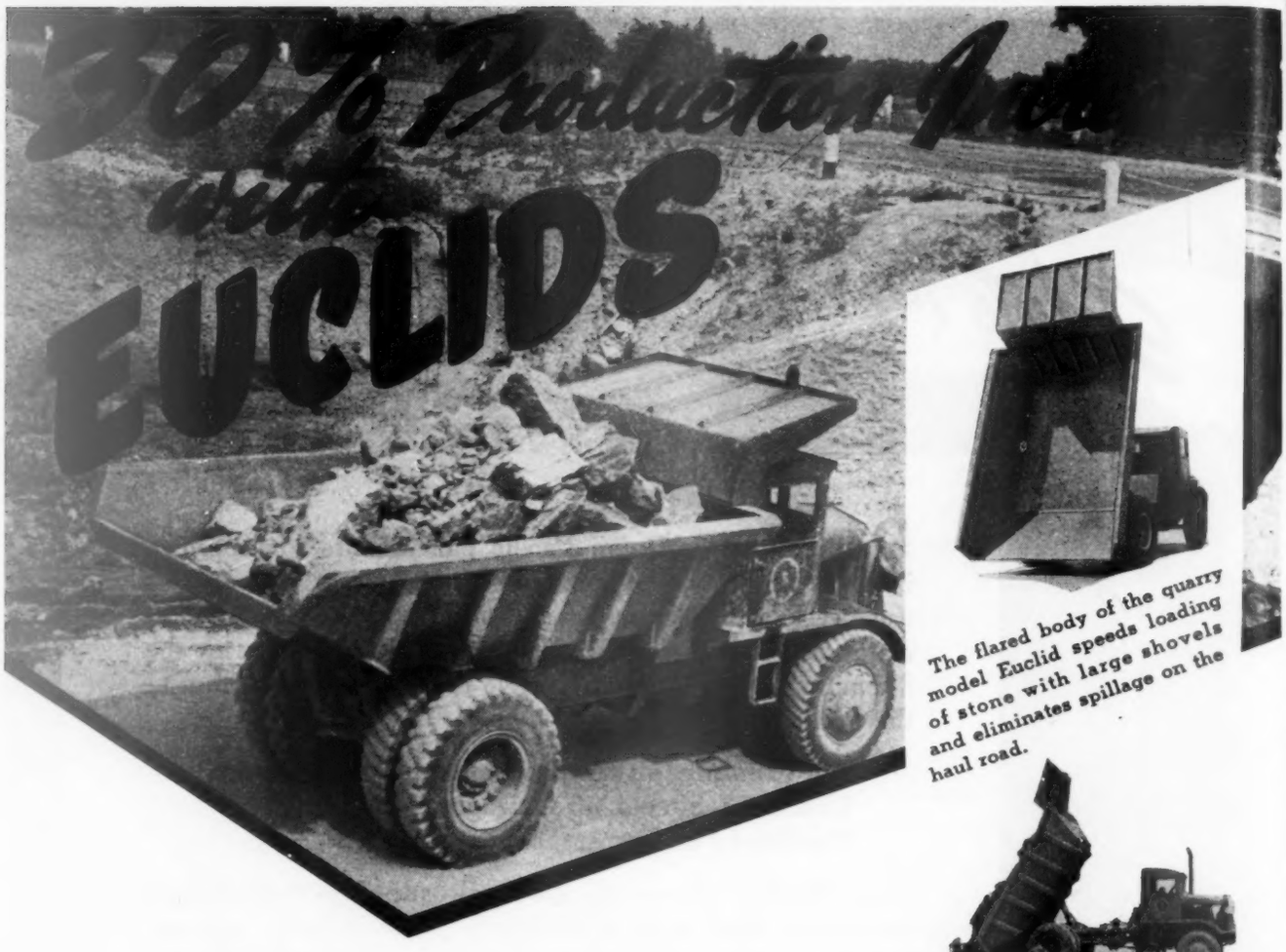
Be Specific— say "Union Pacific"

★ *Union Pacific will, upon request, furnish information about available industrial and mercantile sites in the territory it serves. Address Union Pacific Railroad, Omaha, Nebraska.*

The Progressive

UNION PACIFIC RAILROAD

The Strategic Middle Route



The flared body of the quarry model Euclid speeds loading of stone with large shovels and eliminates spillage on the haul road.

Tapered chute construction and high dumping angle mean quick, clean shedding of the load — save time in dumping.

● After more than 40 years of quarry operation by rail, The Bessemer Limestone and Cement Co. converted its haulage system to heavy duty trucks thereby achieving a production increase of approximately 30%. The job involves removal of overburden and delivery of blasted rock to a crushing plant. At this quarry in western Pennsylvania, Bessemer operates 5 Quarry Type Rear-Dump Euclids.

After receiving a 15-ton load from a 5 cu. yd. shovel, the Euclids travel 6500 feet to the crushing plant at an average speed of 12.3 m.p.h. Total round trip time averages 13 minutes — better than 4 trips per hour.

The flexibility of truck haulage over constantly changing roads has resulted in lower costs and increased production. For overburden removal, too, Euclids have proved their efficiency and dependability.

Have you investigated the possibilities of Euclids for your own operations? Your distributor can supply helpful information and literature.

The EUCLID ROAD MACHINERY Co.
CLEVELAND 17, OHIO

★

EUCLID EARTH MOVERS

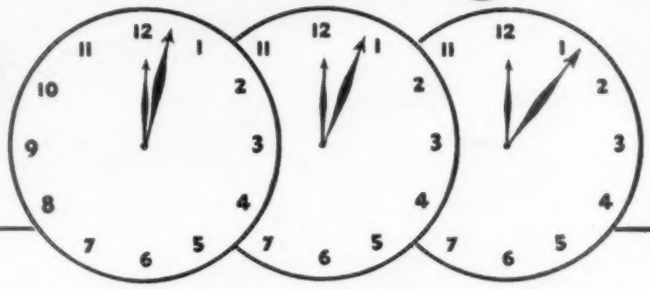
Rear-Dump Euclids
Capacities of 15 to 22 tons — 9.2 to 20.7 cu. yds., struck... loaded top speeds of 22 to 35 m.p.h.... powered by 150 to 275 h.p. Diesel engines.

Bottom-Dump Euclids
Capacities of 20 to 32 tons — 13 to 42.9 cu. yds., struck... loaded speeds from 26 to 34.4 m.p.h.... powered by 150 to 275 h.p. Diesel engines.

Euclid Loader
Fast loading of hauling equipment ...makes shallow cuts to 9'6" wide... maximum cutting depth of 24"...54" belt powered by 150 h.p. engine.

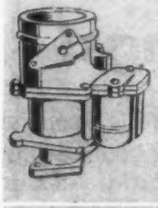
EUCLID SELF-POWERED HAULING EQUIPMENT
For EARTH ROCK COAL ORE

How to Cut Metal Cleaning Time to MINUTES



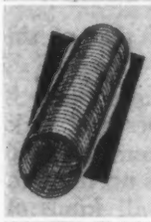
NEW, FAST-ACTION DETERGENT CLEANS FERROUS AND NON-FERROUS METALS...Easy to Handle

TYPICAL USES FOR Solvent "26"



CARBURETORS—Solvent "26" removes gum, gasolene sediment and other accumulations of dirt.

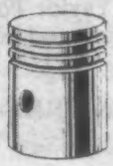
SPARK PLUGS—Solvent "26" safely cleans porcelain; helps loosen carbon deposits.



METAL PLATES AND SCREENS—Solvent "26" restores clear, clean finish to any metal surface.

DIES AND STAMPING—Solvent "26" removes drawing compounds from die-formed or stamped metal.

LABORATORY EQUIPMENT—Solvent "26" frees glass and metal tubing and their supports of gums, varnishes and other incrustations or deposits.



PISTONS—Removes lacquers, gums, resins, etc. from gas, gasolene and diesel engine pistons and rings. Also effective for cleaning all parts of dismantled motors, engines and machinery.

REMOVES:

Oil • Grease • Gums • Varnishes • Lacquers • Paints
Carbonaceous Deposits • Asphaltic Products

FROM:

Steel • Cast Iron • Aluminum • Porcelain • China
Chrome and Nickel Plate • Stone • Precious Metals
Brass • Washable Fabrics

Used throughout the war in critical industry as a superior cleaning agent, newly-developed SOLVENT "26" is now available for all industrial needs.

Offering many advantages in time, labor and cost over other present cleaning methods . . . Solvent "26" is so effective a detergent it can be used at *ordinary* room temperatures.

The fast action of Solvent "26" reduces cleaning time from hours to minutes on dismantled engine parts and all kinds of machinery. Simply dip, rub, brush or spray it on. Then flush clean with hot water.

Mail the coupon today for literature and information leading to a demonstration of this unique product in your own plant.

CITIES SERVICE OIL COMPANY
ARKANSAS FUEL OIL COMPANY

CITIES SERVICE OILS
ONCE-ALWAYS

Cities Service Oil Company
Room **578**
70 Pine Street
New York 5, N. Y.

Gentlemen: I am interested in a demonstration of Solvent "26"—at no cost or obligation.

Name.....

Title.....

Company.....

Address.....

City..... State.....

There's no illusion about the cash savings!

YES, it's easy to handle light wall Taylor Spiral Pipe, and of course that cuts costs all along the line—means a lot more piping installed per man per day.

If the strength of Taylor Spiral Pipe were in the same proportion to its weight as that of heavy pipe, the savings it offers would be limited to light duty applications. But that isn't the case at all. Its spiral construction—that reinforcing spiral seam—makes it stronger than any other kind of pipe of equal wall thickness.

In hundreds of installations this light-but-rugged pipe has proved that it can handle a large percentage of the moderate and low pressure services ordinarily assigned to Standard Thickness pipe—handle them adequately and with strength and service life to spare.

Check over the services listed below. If you are now using Standard Thickness pipe for applications of this kind, changing to Taylor Spiral Pipe will cut your costs way down—in many cases to half that of the heavy pipe it so adequately replaces.

Switching to Taylor Spiral Pipe for such uses is made easy by the complete range of sizes and wide variety of fittings. Thicknesses range from 18 to 6 gauge; sizes from 4″ to 42″; joint lengths up to 40 ft. All types of end joints and couplings, all kinds of fittings and specials or fabricated assemblies are produced by Taylor Forge & Pipe Works, assuring complete service and undivided responsibility.

TAYLOR FORGE & PIPE WORKS

General Offices & Works: Chicago, P. O. Box 485 ★ New York Office: 50 Church St. ★ Philadelphia Office: Broad Street Station Bldg.

CHANGE TO TAYLOR SPIRAL PIPE FOR:

- High and Low Pressure Water Lines
- Low Pressure Steam and Air Lines
- Steam and Diesel Exhaust Lines
- Vacuum and Suction Lines
- Blower Piping
- Sand and Gravel Lines
- Industrial Gas Lines
- Oil and Gas Gathering Lines
- Swing Pipe
- Spray Pond Piping
- Hydraulic Mining
- Dredge Lines

HERE IS A *Better* WAY TO WASH SPECIAL INDUSTRIAL SANDS—

AKINS *Classifiers*

Close Separation for GLASS and FOUNDRY Sand

Low Power Cost—Maintenance Negligible

If you supply washed sand for special uses . . . such as foundry moulding or glass making, it will pay you to investigate the AKINS Classifier. When equipped with wash boxes and lifters on spirals, this machine produces sands to exacting specifications for practically any special industrial use. Power requirements are low, maintenance cost almost nothing. Unloading is unnecessary to start after shutdown . . . a big advantage in less than 24 hour operation. Let one of our engineers present the facts in detail.

★

LOWDEN DRYERS
SKINNER MULTIPLE HEARTH ROASTERS
BALL, ROD & TUBE MILLS
SMELTING EQUIPMENT

COLORADO IRON WORKS Company

Canadian Locomotive Co., Ltd., Kingston, Ont., Can.
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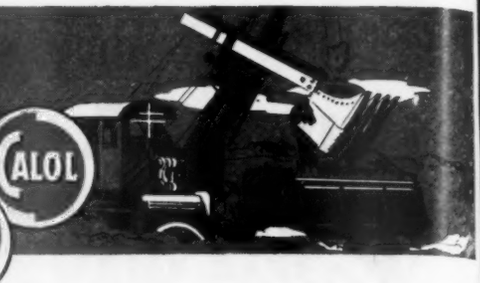
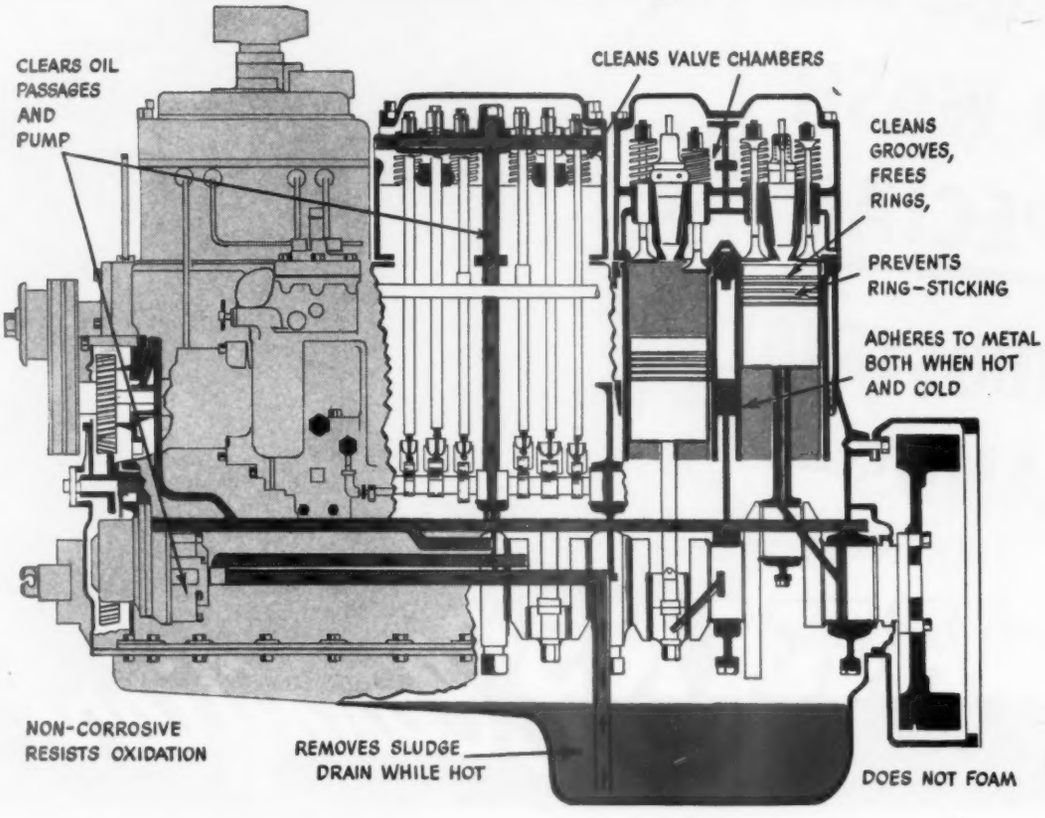
Head, Wrightson & Co. (So. Africa) Ltd. Johannesburg
The Clyde Engineering Co., Ltd., Granville, N. S. W.

MAIN OFFICE & WORKS: DENVER 2, COLO., U. S. A.

STANDARD ENGINEERS NOTEBOOK




CLEARS OIL PASSAGES AND PUMP
CLEANS VALVE CHAMBERS
CLEANS GROOVES, FREES RINGS,
PREVENTS RING-STICKING
ADHERES TO METAL BOTH WHEN HOT AND COLD
NON-CORROSIVE RESISTS OXIDATION
REMOVES SLUDGE DRAIN WHILE HOT
DOES NOT FOAM

Heavy duty oil cleans engines while they're running

Clean carbon, sludge, gum and other harmful matter from heavy truck engines without tearing them down by purging with RPM Heavy Duty Motor Oil.

It will even loosen stuck rings if they are not cemented in too tightly with accumulations of sticky, burned-on gum.

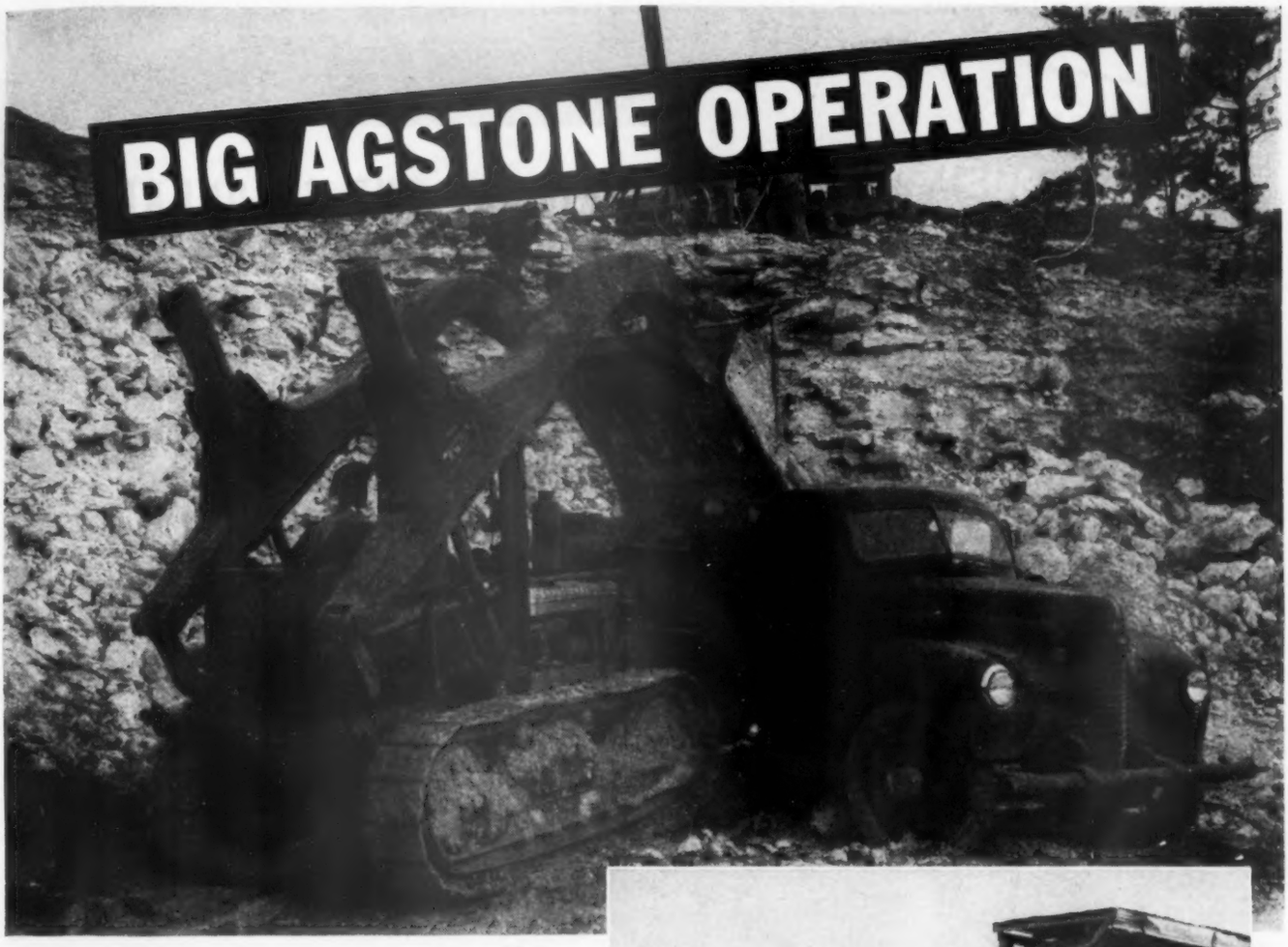
Selected base oils plus patented compounds give RPM Heavy Duty Motor Oil the ability to act on and remove carbonaceous deposits and keep them dispersed in the oil so they can be drained from the engine. The recommended purging procedure follows:

1. Drain present oil from crankcase while hot. 2. Renew filter element to trap abrasive particles that may be carried into circulation during purging. 3. Fill crankcase with RPM Heavy Duty Motor Oil. 4. Run engine at a fast idle for two hours, maintaining water jacket temperature of approximately 200° minimum. 5. Drain again while hot and refill with RPM Heavy Duty Motor Oil. 6. Place engine in regular service and drain at one-half normal drain period or 750 miles, whichever comes first, for two or three drains. Check oil frequently as removal of deposits may temporarily increase oil consumption. 7. Drain while hot. Check oil filter and replace when necessary. 8. Refill with RPM Heavy Duty Motor Oil, returning to regular oil drain and filter change period, and continue to use RPM Heavy Duty Motor Oil.

For additional information and the name of your nearest Distributor, write Standard of California, 225 Bush Street, San Francisco 20, Calif., or California Commercial Company, 30 Rockefeller Plaza, New York 20, N. Y.

FOR EVERY JOB A **STANDARD OF CALIFORNIA** TEST-PROVED PRODUCT

BIG AGSTONE OPERATION



Powered by INTERNATIONAL

HERE'S an example of how International Power helps to produce agstone at low cost. This quarry operation is conducted by Dermott Shemwell & Sons of Albany, Georgia. Although originally producing only for their own plantation, the Shemwell organization, known as the Armena Lime Company, is now an important commercial producer.

A versatile, power-packed TD-9 International Crawler Tractor equipped with a 'dozer shovel, strips off the overburden and recovers the stone after blasting operations. The stone is then hauled to the primary crusher which is powered by a 60 h.p. International gasoline engine.

Durable, dependable International Power handles these jobs with the greatest efficiency and at lowest cost. Ability to stand up under hard usage and freedom from breakdowns and expensive repairs make International TracTracTors and Industrial Power Units the popular choice for the tough jobs.

Your International Industrial Power distributor or dealer will be glad to show you how International Power can be profitably applied to your particular operations. See him at your first opportunity and find out how International Power can be the index to greater operating profits.

Industrial Power Division
INTERNATIONAL HARVESTER COMPANY
180 North Michigan Avenue Chicago 1, Illinois

INTERNATIONAL Industrial Power

THIS ROCKBUSTER BREAKS 24" to 30" CUBES DOWN TO 1" or UNDER AT A RATE OF 200 to 300 T. P. H.

A PRIMARY AND SECONDARY CRUSHING UNIT COMBINED

A single pass through this giant swing hammer crusher makes "little ones" out of the "biggest ones" with record speed. The final product is cubical. Investigate.

THE JEFFREY MANUFACTURING COMPANY

917-99 N. Fourth St., Columbus 16, Ohio

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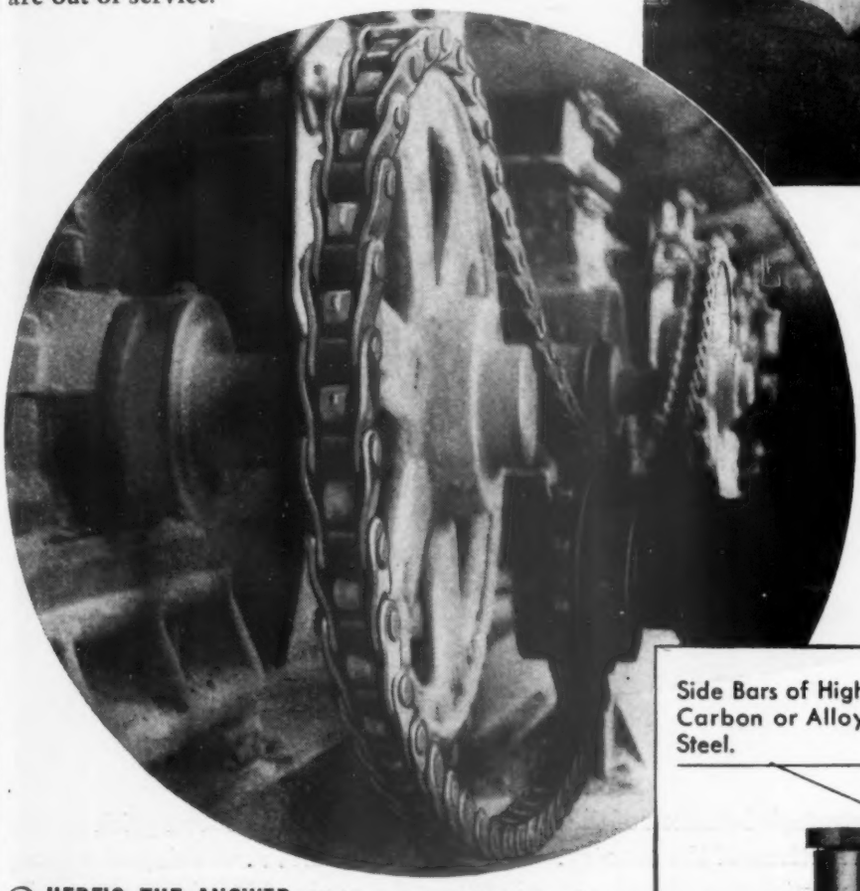
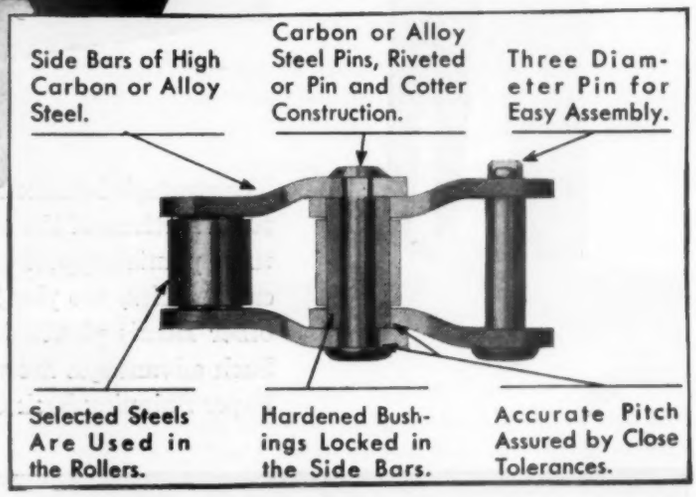
ESTABLISHED 1877

IT GETS *PUNISHED* BECAUSE IT'S *EXTRA GOOD!*

① YES, HERE'S CHAIN BELT that's so extra good we recommend it for punishing service. Tough operating conditions . . . heavy loads . . . shocks . . . Rex Chabelco steel chain belts take them right in stride. They keep going long after ordinary chains are out of service.



② FOR TOUGH SERVICE CONDITIONS, the chain operation on this conveyor drive is hard to beat. Dust, grit, and shock loads really test a chain's mettle. But the Rex steel chain belts driving the conveyor keep right on rolling . . . transmitting positive power and carrying the load smoothly and efficiently. But what makes them so tough?


Side Bars of High Carbon or Alloy Steel.
Carbon or Alloy Steel Pins, Riveted or Pin and Cotter Construction.
Three Diameter Pin for Easy Assembly.
Selected Steels Are Used in the Rollers.
Hardened Bushings Locked in the Side Bars.
Accurate Pitch Assured by Close Tolerances.

③ HERE'S THE ANSWER. Take a good look at the cross-section of this Chabelco link. Note particularly the three-diameter pin. See how its milled flat end is locked in the side bar. Notice the offset side bar construction. Heavy force fits of precision machined parts result in the finest quality chains.

* * * *

Rex Chabelco steel chain belts are the answer to drive and conveyor problems where strength and long life are essential. The Rex Man will help you with your chain belt application problems. And for engineering data on Rex chain belts, ask for the 768-page catalog, No. 444. Chain Belt Company, 1604 W. Bruce St., Milwaukee 4, Wis.

REX CHAIN BELTS

Manufactured in every available type for the positive transmission of power, timing of operations and conveying of materials.

CHAIN BELT COMPANY OF MILWAUKEE

Rex Chain Belt and Transmission Division, Rex Conveyor and Process Equipment Division, Milwaukee 4, Wisconsin • Baldwin-Duckworth Division, Springfield 2, Massachusetts

"Just look at the locations of those six Bemis Multiwall plants!"

"Yes, that's another reason IT PAYS TO BE A BEMIS MULTIWALL PAPER SHIPPING SACK CUSTOMER!"

The strategic locations of the six Bemis Multiwall plants mean quick service to all sections of the country. • And that's not all . . . working as a team, these plants support each other in filling the needs of Bemis customers. In emergencies, the plant with which an order is placed can depend on five other Bemis plants for assistance in meeting scheduled shipping dates. Such advantages are why folks say: • "It pays to be a Bemis Multiwall Paper Shipping Sack Customer."

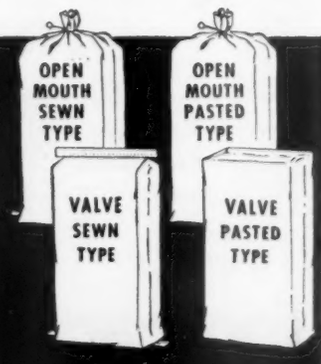
Bemis Multiwall Paper Shipping Sacks

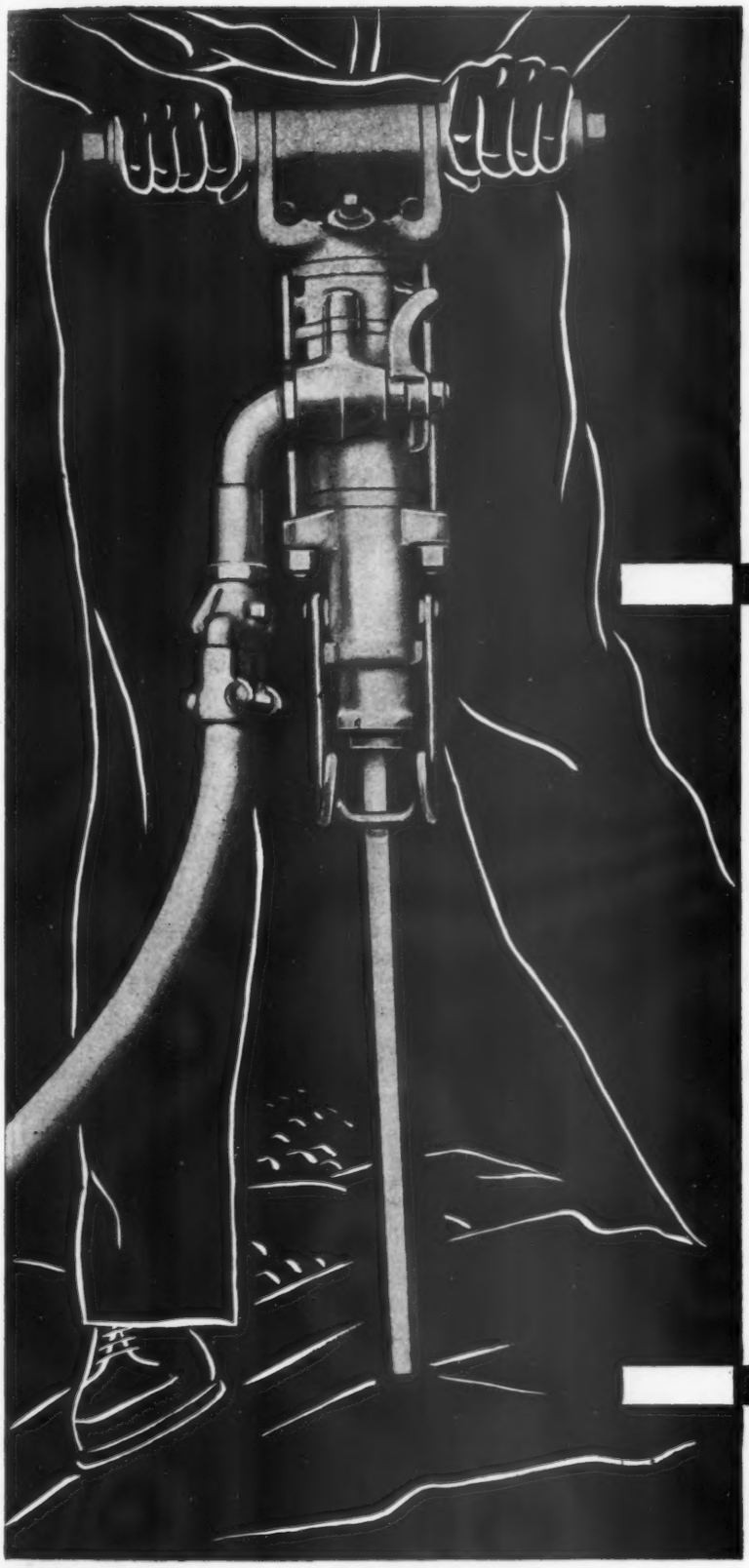
6 PLANTS

Peoria, Ill. · East Pepperell, Mass. · Mobile, Ala. · San Francisco, Calif. · Wilmington, Calif. · St. Helens, Ore.

BEMIS BRO. BAG CO.

OFFICES: Baltimore · Boston · Brooklyn · Buffalo · Charlotte · Chicago · Denver · Detroit · East Pepperell · Houston · Indianapolis · Kansas City · Los Angeles · Louisville · Memphis · Minneapolis · Mobile · New Orleans · New York City · Norfolk · Oklahoma City · Omaha · Orlando · Peoria · St. Helens, Ore. · St. Louis · Salina · Salt Lake City · San Francisco · Seattle · Wichita · Wilmington, Calif.





"Bantam Class" Sinker of Multiple Uses!

LIGHT-WEIGHT CP-22 SINKER

DESIGNED for drilling in soft-to-medium formations, the 28-pound CP-22 Sinker gives exceptional performance for its weight on many different kinds of work. Light weight and short overall length make it ideal for use in restricted quarters and flat or upward drilling in metal mines, coal mines, quarries and for general contracting use. The CP-22 Sinker Drill is known for its high drilling speed, its very efficient hole-cleaning and low air consumption. Write today for Bulletin 820.

CP makes a Sinker Drill for every need from the light, 28-lb. CP-22 to the 119-lb. CP-60. Write for full information.

★★★★★★★★★
PNEUMATIC TOOLS
ELECTRIC TOOLS
HYDRAULIC TOOLS
ROCK DRILLS

CHICAGO PNEUMATIC
TOOL CP COMPANY
General Offices: 8 East 44th Street, New York 17, N. Y.

★★★★★★★★★
AIR COMPRESSORS
VACUUM PUMPS
DIESEL ENGINES
AVIATION ACCESSORIES

PRODUCTION *for* PEACE

A year of remarkable history has just passed, in which the normal routine way of living for most every individual in many countries of the world, was disturbed. Citizens everywhere were devoting their energies to war . . . to destroy, instead of to build.

INDUSTRIAL RUBBER PRODUCTS that Quaker is making NOW for civilian use

(PARTIAL LIST ONLY)

- Transmission Belting
- Agricultural Belting
- Conveyor Belting
- Elevator Belting
- Air Drill Hose
- Chemical Hose
- Creamery Hose
- Fire Hose
- Fuel Oil Hose
- Garden Hose
- Gasoline Hose
- Tank Car and Tank Truck Hose
- Sand Blast Hose
- Spray Hose
- Steam Hose
- Suction Hose
- Oil Suction and Discharge Hose
- Water Hose
- Road Contractors' Hose
- Welding Hose
- Tubing
- Rod Packings
- Sheet Packings
- Gaskets
- Washers
- Pump Valves
- Moulded Articles

. . . *and* NOW *it is* 1946

1946 starts out with a fresh inspiration to guide us in peacetime endeavors. Quaker had no reconversion problem. The products of Industrial Rubber Goods which we manufacture are very similar, whether used for war industries or for peace industries. The paper work on cancellations of Government orders is just about completed. Full scale production on civilian orders started August 17 and has been going on steadily ever since.

Naturally we are making headway on our Backlog of orders. It still will be several months before critical raw materials will be available in quantities wanted. But we are making better deliveries on many items, especially on Fire Hose, Mill Hose and in Wrapped Construction Hose in sizes 3″ and larger.

Our suggestion to the keen buyers, with an eye on the future, is to place their orders well in advance of requirements. This will insure getting your merchandise when desired.

Anticipate your needs on Industrial Rubber Products and send your orders to Quaker NOW.

"If there is a way to get it done—Quaker will do it"

QUAKER RUBBER CORPORATION

PHILADELPHIA 24, PA.

NEW YORK 7 • CLEVELAND 15 • CHICAGO 16 • HOUSTON 1

Western Territory: QUAKER PACIFIC RUBBER COMPANY

SAN FRANCISCO 5 • LOS ANGELES 21

Lugging coal—you've done it, perhaps, in a small way. In a big way, it's a back-breaking job. But not for this conveyor belt of ours, in a Pennsylvania coal mine; despite reverse bending, a right-angle feed, large and unequal pieces to be carried, and an uneven distribution of load.

All these difficulties have meant nothing to it. It has been operating for many years, and plans to be for many more. BWH quality in materials, and our exclusive Rotocure process of vulcanization, are the answer.

Something rough and tough to carry? Ask our nearest distributor, or write to us. You'll be convinced.

BOSTON WOVEN HOSE & RUBBER COMPANY
WORKS: CAMBRIDGE, MASS.
POSTAL ADDRESS: BOX 1071
BOSTON 3, MASS., U.S.A.

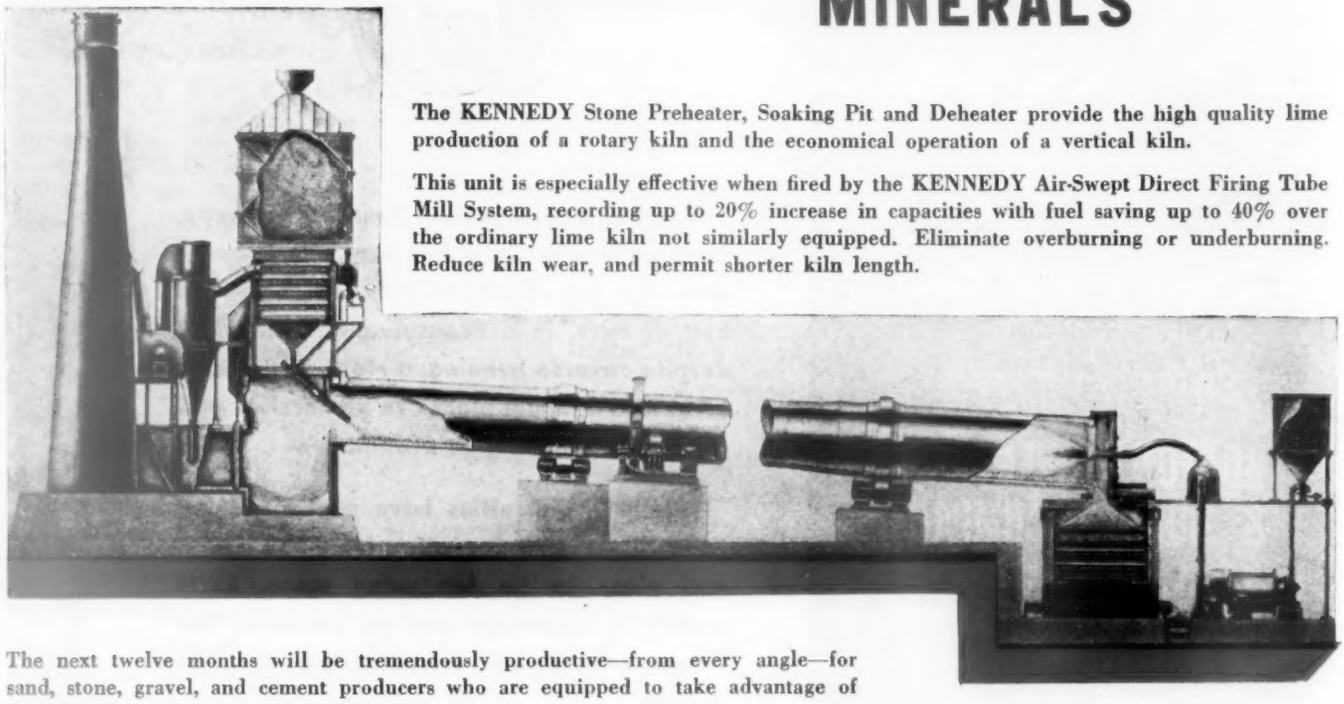
KEEP THOSE BONDS

Made by the Rotocure process of continuous vulcanization which replaces variation with uniformity.

. . . for a Year of Record Achievement

USE KVS

PROCESSING EQUIPMENT *for* PRODUCING NON-METALLIC MINERALS



The KENNEDY Stone Preheater, Soaking Pit and Deheater provide the high quality lime production of a rotary kiln and the economical operation of a vertical kiln.

This unit is especially effective when fired by the KENNEDY Air-Swept Direct Firing Tube Mill System, recording up to 20% increase in capacities with fuel saving up to 40% over the ordinary lime kiln not similarly equipped. Eliminate overburning or underburning. Reduce kiln wear, and permit shorter kiln length.

The next twelve months will be tremendously productive—from every angle—for sand, stone, gravel, and cement producers who are equipped to take advantage of the upward surge in general construction.

Many highly successful installations, already with imposing war-time production records because of super-performing KVS machines, are ready to meet any demands by a fast-growing market.

KVS units combine durability, high output, and operating economy to assure "a banner year *every* year" for plants specializing in the use of this modern equipment.

KENNEDY-VAN SAUN MFG. & ENG. CORPORATION

in Operating Efficiency and Profit

KENNEDY
Ball-Bearing
GEARLESS CRUSHER

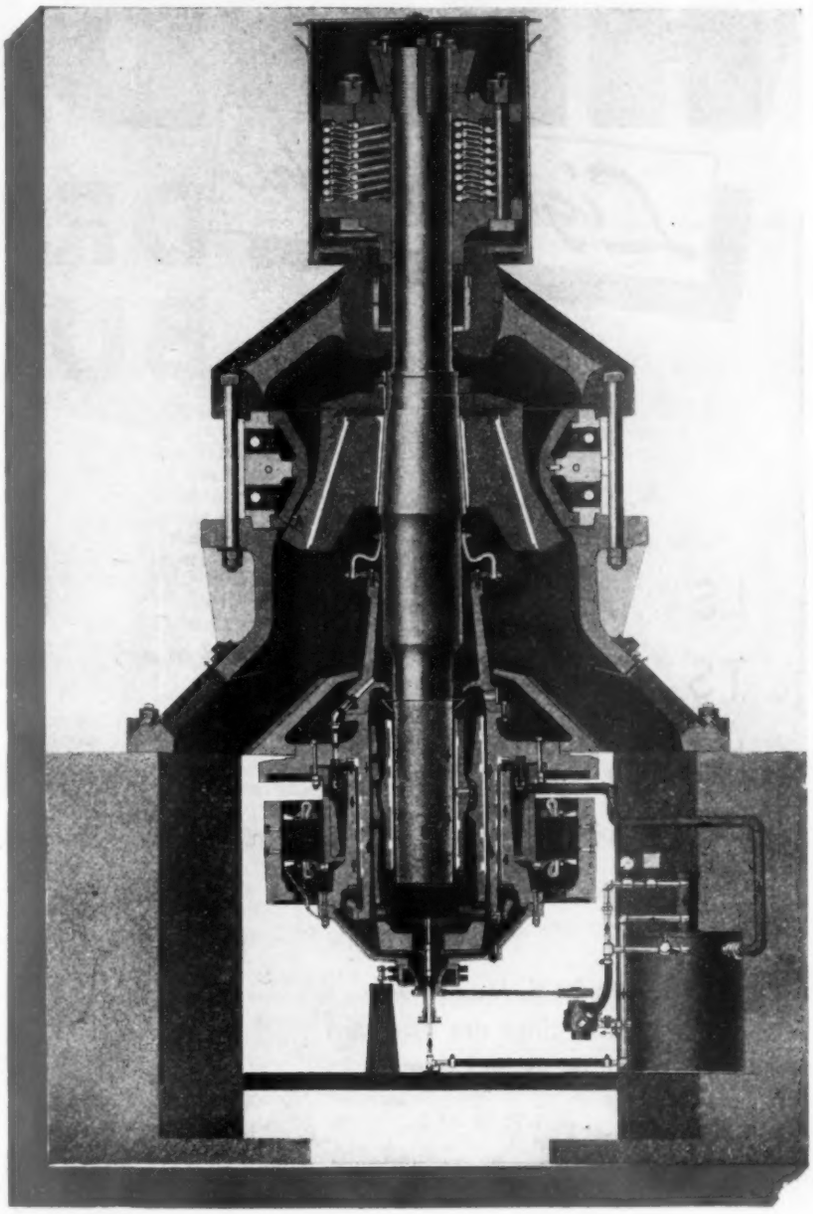
. . . low head type for fine crushing.

This KVS unit does *more* work than any geared crusher, and costs *less* for operation, maintenance and repairs.

This machine has produced 145 tons per hour when set to 7/16" between the head and concaves at the bottom.

Reversible concaves or grinding ring for extra wear. Forced feed lubrication. Quick adjustment of crusher opening. Easy accessibility.

KENNEDY Ball-Bearing Gearless Gyratory Crushers are also available in standard and short-shaft types. Wide range of capacities.



KVS MACHINERY includes: a complete line of equipment for burning, crushing, pulverizing, sand washing, screening, drying, power plant equipment, boilers, etc.

Write for Bulletins

Representatives in all principal cities in the United States and foreign countries including Ejido 7-503, Mexico, D. F.

ARMY E NAVY

2 PARK AVENUE • NEW YORK 16, N. Y. FACTORY: DANVILLE, PA.

HENDRIX

Lightweight

DRAGLINE BUCKETS

TYPES

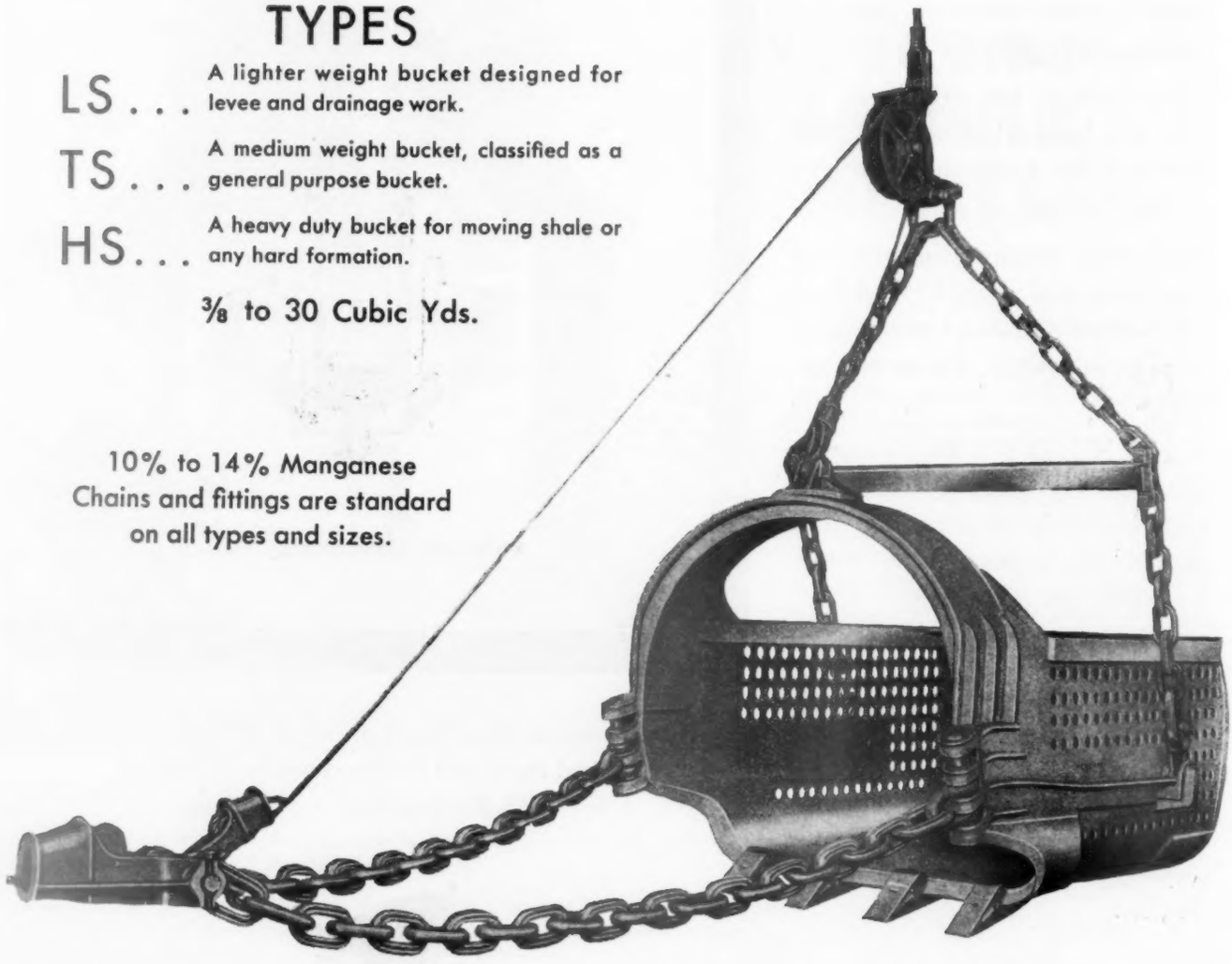
LS . . . A lighter weight bucket designed for levee and drainage work.

TS . . . A medium weight bucket, classified as a general purpose bucket.

HS . . . A heavy duty bucket for moving shale or any hard formation.

⅜ to 30 Cubic Yds.

10% to 14% Manganese
Chains and fittings are standard
on all types and sizes.

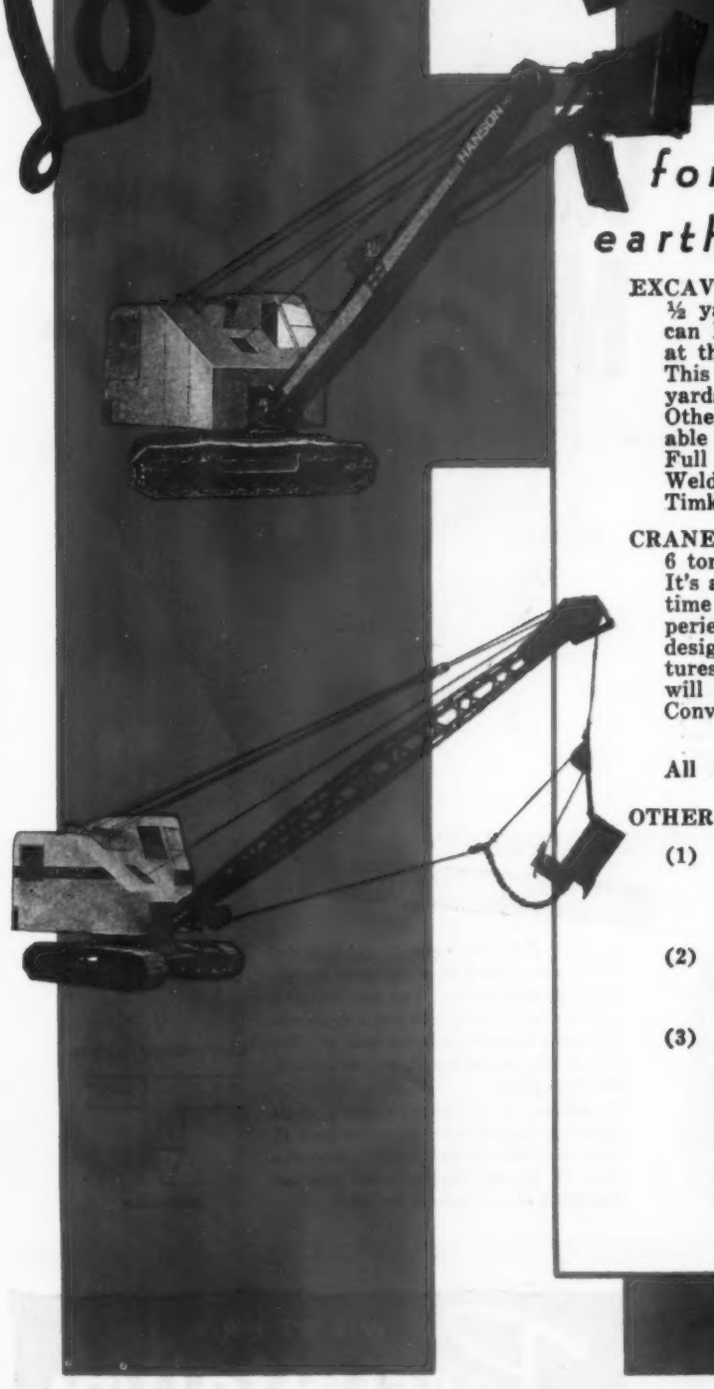


WRITE FOR DESCRIPTIVE LITERATURE—
OR ASK YOUR DEALER

Also available without perforations.

DESOTO FOUNDRY, INC. • MANSFIELD, LOUISIANA

Look to HANSON



for THE BEST in earth-handling equipment

EXCAVATORS -- that really produce. In ⅜ yard and ½ yard sizes (Models 31 and 41). The excavator that can Hoist, Crowd and Swing or Propel and Steer all at the same time!
This design feature will enable you to handle more yards per hour -- make more dollars per hour.
Other Hanson features that mean dependable, profitable operation on your excavating jobs --
Full revolving. Chain crowd. Low center of gravity. Welded steel construction. Large area crawlers. Timken roller bearings.

CRANES -- that make money for you. In 4 ton and 6 ton sizes -- Gasoline or Diesel.
It's a crane that has demonstrated its rugged strength time and again. It's the outgrowth of 30 years experience in this machinery field, combining scientific design and manufacturing skill. A study of these features -- a short conversation with a Hanson owner will convince you that Hanson is the buy!
Convertible to: Shovel, Trench Hoe, Dragline, Clamshell, Piledriver.

All ways a producer -- always dependable.

OTHER HANSON PRODUCERS

(1) **Truck shovels and Cranes.**
Shovels and cranes shown above (Models 31 and 41) are also available as truck mounted instead of crawler mounted.

(2) **Yard & Dock Cranes**
A mobile, one-man unit, 2 to 4 ton life and carry, 360° swing, 2 to 40 M.P.H.

(3) **Heavy Duty Trailers**
Ideal for hauling contractors' heavy equipment. Available as either semi or full trailer with capacities from 10 to 40 tons. Gooseneck type, massive H beam construction -- tough as Gibralter! Oscillating rear axle construction assures a level, safe ride. Just the answer to your equipment haulage problem.
Write for complete catalogs and specifications on any or all of this equipment.

ARMY E NAVY

THE HANSON CLUTCH AND MACHINERY CO.
TIFFIN · OHIO

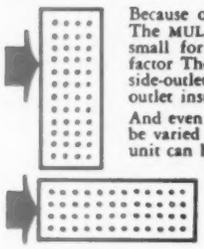
Question: WHICH DUST RECOVERY EQUIPMENT GIVES NOT ONE—BUT ALL THESE IMPORTANT ADVANTAGES?

MINIMUM PLANT SPACE

The unusual compactness of The MULTICLONE is a valuable advantage whether the installation is made in a new plant or an existing structure. The accompanying chart shows how other types of equipment compare with The MULTICLONE on space requirements, all figures based on units of comparable performance. Note how the MULTICLONE requires as little as *1/6th* the floor space, as little as *1/4th* the cubic space of other equipment. Put these figures in terms of costly plant space in *your* building and figure how vital this MULTICLONE saving is!

Make	Relative Space Requirements In Sq. Ft.	In Cu. Ft.
Multiclone	1.0	1.0
Collector A	2.1	1.8
Collector B	5.9	3.2
Collector C	6.8	3.9

MAXIMUM ADAPTABILITY



Because of its great adaptability to "shoe horn" spaces, The MULTICLONE can often be fitted into areas far too small for other equipment. Where low headroom is a factor The MULTICLONE can be installed with side-inlet side-outlet. Or for restricted side clearance, side-inlet top-outlet installations can easily be made.

And even the shape of the MULTICLONE unit can readily be varied to fit space limitations. For example, a 48 tube unit can be 4 tubes deep and 12 wide to fit a wide, shallow space . . . or 12 deep and 4 wide to fit a long narrow space . . . or still other arrangements without affecting the operation or capacity of the unit. Gives maximum flexibility to fit cramped spaces!

HIGH RECOVERY

It is an established fact that the separating efficiency of a cyclonic tube becomes greater as the tube diameter *decreases*, due to the fact that the smaller the radius the greater the centrifugal forces that are generated. And higher centrifugal forces mean more complete separation of even the *very fine*, as well as the coarse particles.

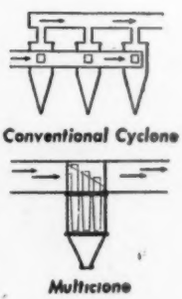
The patented *vane* in the MULTICLONE—an exclusive feature—makes the use of small tubes practical, without complicated manifolding and permits compacting many *small*-diameter tubes into one simple, highly efficient unit.

This is one of the reasons why The MULTICLONE collects not only the coarser particles, but also an unusually high percentage of the *very fine* particles of 10 microns and less!

SIMPLE INSTALLATION

In place of the costly complicated inlet and outlet manifolding necessary with conventional cyclone systems, The MULTICLONE requires only a *single* inlet and a *single* outlet header to supply an entire bank of tubes. It's simple, easy to install, easy to insulate, easy to maintain.

In addition, in the MULTICLONE a single collecting hopper serves an entire bank of tubes—far easier to both install and service than the separate-hopper-for-each-tube arrangement of conventional cyclones!



STILL OTHER ADVANTAGES. **The MULTICLONE is the result of over 38 years of concentrated research in the field of dust recovery, beginning with the first commercial application of the well-known COTTRELL Electrical Precipitator. It embodies so many important advantages—advantages that mean long life, low draft loss, minimum maintenance, and high operating efficiency—that you should get the full story of The MULTICLONE before you invest in *any* recovery equipment. Let one of our trained engineers make recommendations on the most economical solution to your recovery problem. A wire, letter or phone call places this assistance at your service!**

Send for this free MULTICLONE booklet.

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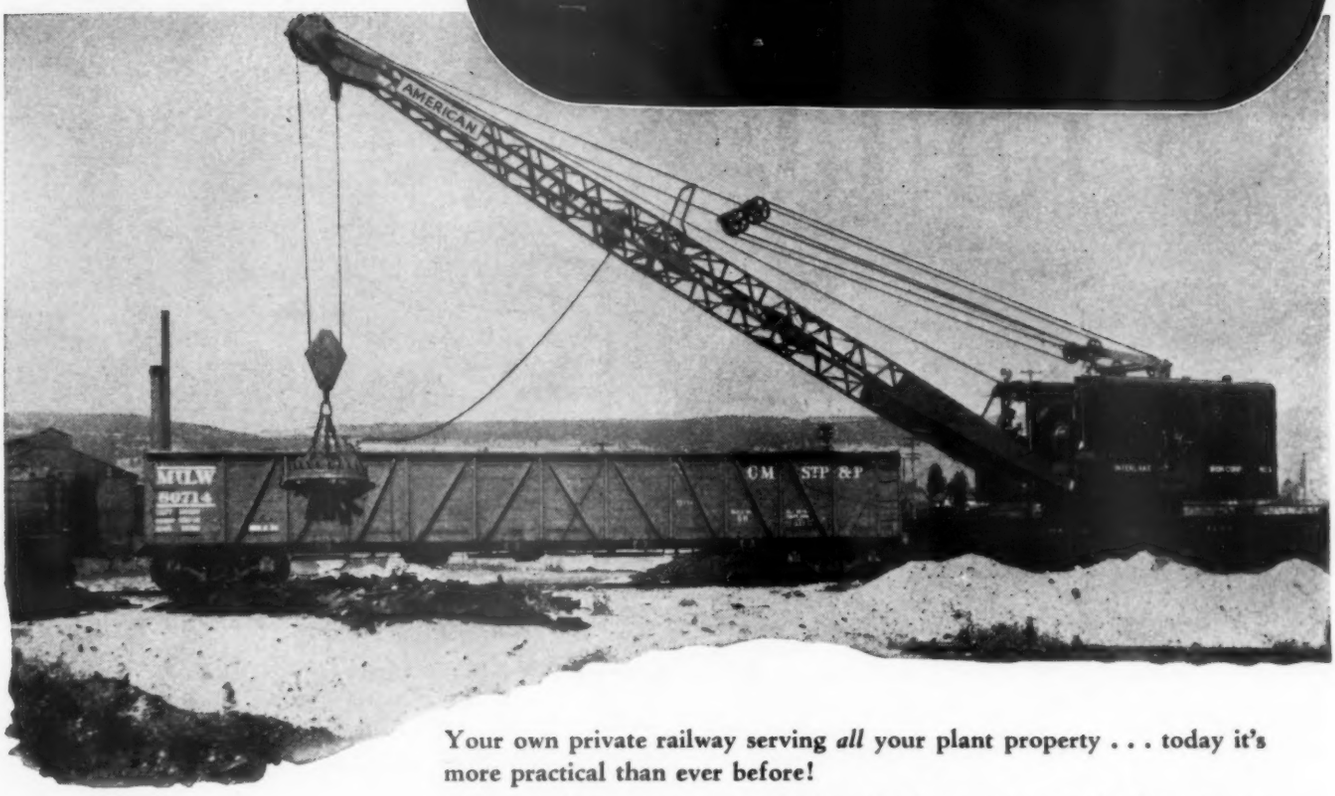

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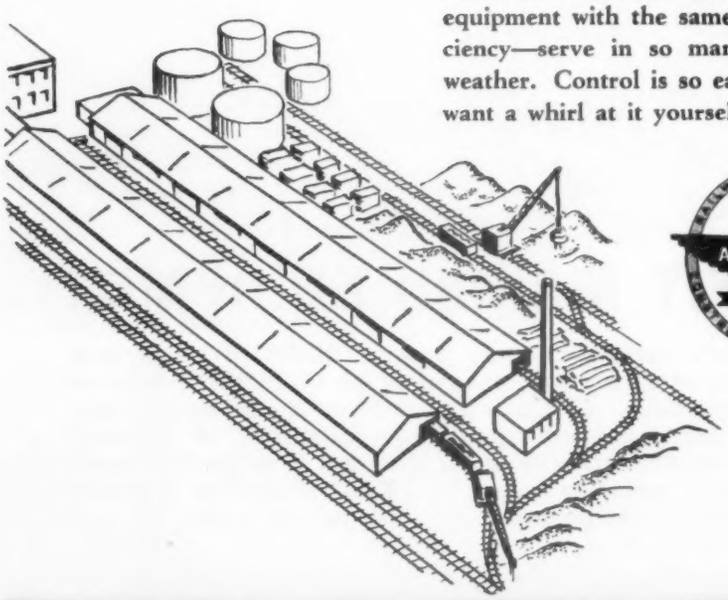

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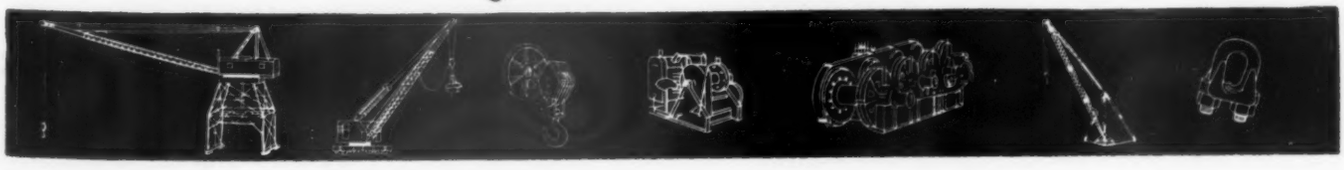

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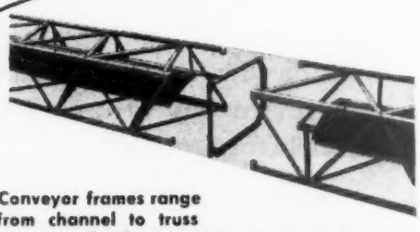
How 4-WAY B G Engineering

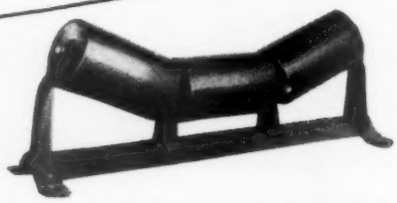
PROVIDES THE PROPER COMBINATION FOR PEAK CONVEYING EFFICIENCY

Terminals are factory assembled as units, ready for bolting to conveyor frame. Field assembly of miscellaneous pulleys, bearings, and other parts, is completely eliminated. Barber-Greene terminals are available in a wide range of types, sizes, and horsepower.

This take-up unit, for instance, is standardized in the same manner as the head-end drive. B-G *pre-engineered* equipment is used in some of the longest conveying systems in the world — for processing, storing and reclaiming.



Conveyor frames range from channel to truss type, in depths to meet span requirements. Lengthening a conveyor is merely a matter of adding *standardized* sections. Conveyor system is easily revamped — terminal units attach directly to any section.



Carriers and return rollers are properly designed to furnish maximum strength with minimum weight. All steel, jig-welded construction insures correct alignment. Choice of troughing, flat, self-aligning, or rubber impact carriers— with roller, ball or plain bearings.

1. **PRE-ENGINEERING** by Barber-Greene assures selection of the right equipment for your particular job.

2. **PRE-FABRICATION** of conveyor units saves erection time — guarantees correct assembly and belt alignment.

3. **STANDARDIZATION** permits interchangeability — makes installation, alterations and moving speedier.

4. **VARIETY OF EQUIPMENT** gives you the choice of sizes and types that best meet your requirements.

When you have a material handling problem, call in B-G engineers to help you. Barber-Greene Company, Aurora, Illinois.

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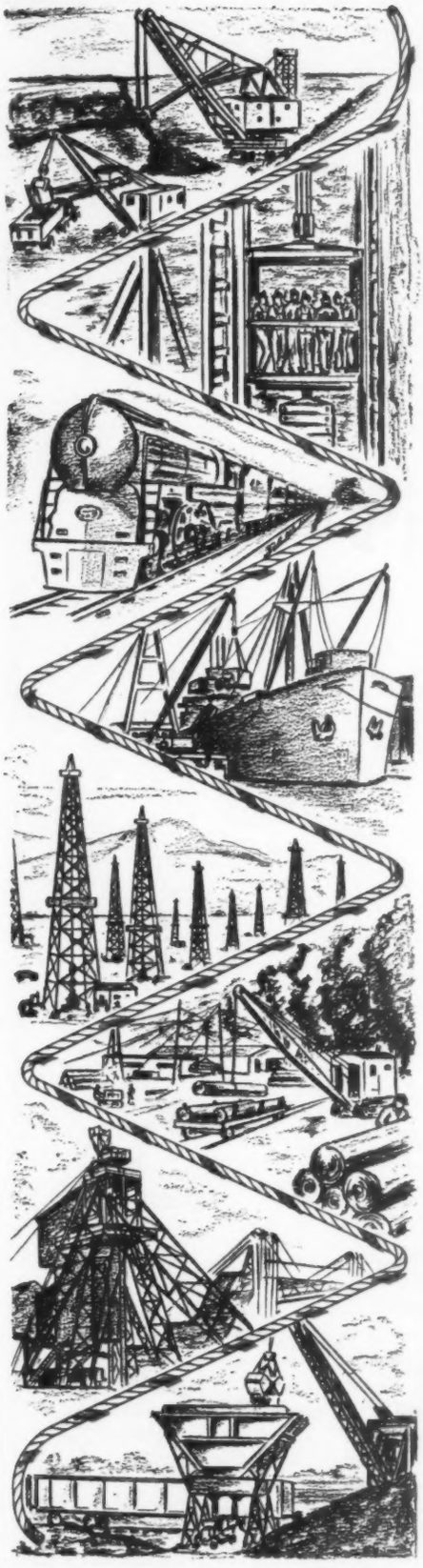
Barber-Greene B G *Constant Flow Equipment*



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Since the first length of "HERCULES" (Red Strand) Wire Rope was produced, it has continued to increase its many uses in one industry after the other, until today, no matter what 'tough job' is in the offing, you'll invariably find "HERCULES" there . . . proving its strength, toughness, elasticity, durability and adaptability.

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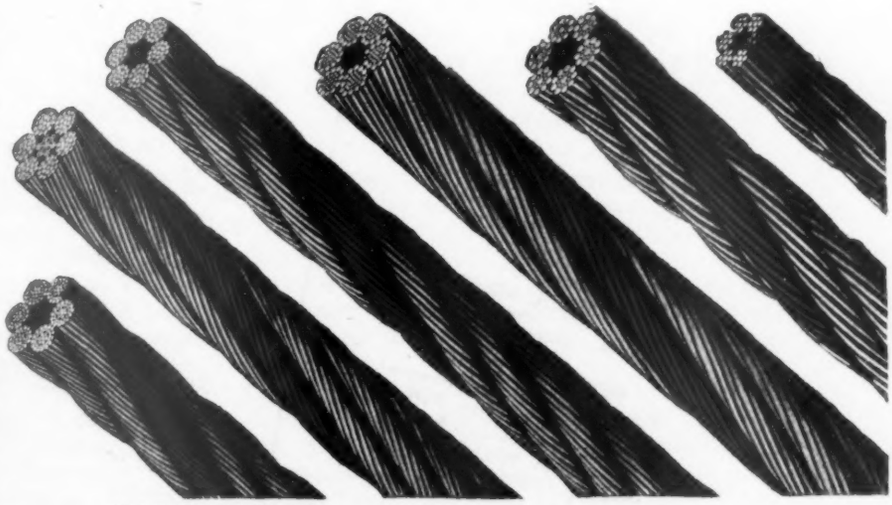
There is a type and construction to fit every wire rope requirement, whether Round Strand or Flattened Strand —Preformed or Non-preformed.

Our Engineering Department will gladly submit detailed recommendations for *any* Wire Rope job! Just ask us.



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PIT AND QUARRY

JANUARY, 1946

Vol. 38 No. 7

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EDITORIAL

The Ability to Pay Higher Wages

THE failure of the Labor-Management Conference to deal with wages and, more recently, that of President Truman's first fact-finding panel, not alone to work out a solution of the disputants' problems but even to prevent the withdrawal of the employer's representatives from the hearings, have left believers in negotiation rather discouraged with the outlook for the peaceful settlement of industrial disputes. People who are neither employers nor organized workers wonder whether friendly discussion will be accepted by both sides in any other important case and whether, if it should be, the participants will enter the negotiations with an honest desire to discover the facts and to further the economic interests of the nation or merely their own. Employers and employees in other industries, too—such as those producing construction and other materials not sold directly to the public—may well ask whether the chances for industrial peace have not, for the present at least, been somewhat worsened.

Prices, wages, and profits are inextricably linked and it is impossible to judge the fairness of demands for increases in any one of them without examining every pertinent fact about the other two. Not much progress can be expected, therefore, in any controversy over wages or conditions of employment, if those involved in it are not willing and prepared to discuss all the relevant economic facts. The acceptance of this principle may lead the negotiators into unfamiliar sources and kinds of information, it may reveal facts that will embarrass, or be detrimental to the claims of, both parties, but it can hardly fail, if sincerely applied, to bring them nearer to agreement and to develop better feeling and closer coöperation between them.

If it is reasonable to ask workers who demand wage increases that they support their claims with factual evidence bearing on the cost of living, irregularity of employment and other factors affecting the size and continuity of their earning power—and we believe that it is—then it would seem to be no less reasonable to ask employers, who assert their inability to grant those claims, to support their contentions with factual evidence bearing on their financial status, even requesting—if necessary to establish the truth—them to submit for examination their book records of costs and profits. The fact that the former type of information has customarily been gathered and published by governmental and other non-commercial agencies for public use, while the latter kind of information has almost always been privately gathered for the sole use of management, should not obscure the truth that each type of evidence is as important and essential to the rendering of a fair judgment as is the other. The ability of an employer to pay the wage increases demanded of him is just as pertinent to an investigator's consideration of what makes a wage rate fair as is the ability of his workers to live decently on the wages they receive from him. If an employer's books show that he can not meet the wage demands made of him, he should have no objection to disclosing the information needed to justify his stand. If they do not support his claim of inability, he will naturally decline to submit them for examination and will attempt to justify his refusal on the ground that the disclosure of such information would violate his rights of privacy and that of his stockholders, would endanger his position in a competitive market, or would imperil the entire private-enterprise system.

After withdrawing from the hearings conducted by President Truman's fact-finding panel the chairman and the president of the employing company issued a prepared statement which said that the company would not "participate voluntarily in what stands out crystal clear at the end of the road—a regimented economy." The board had ruled that the employer's ability to pay would be considered as a factor in determining an increase in wages, and this, according to the company's statement, would "require an appraisal of costs, prices, prospective volume of business, investment factors, expenses and the entire operating program of the business." "The board," it continued, "would assume the most vital functions of management."

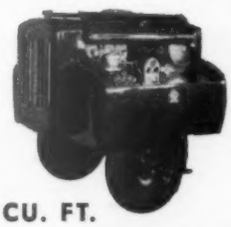
WE understand the natural reluctance of this and other employers to reveal facts indicating the spread between their costs (of which labor constitutes an important part) and their prices (of which profits may be a small or a large part). That kind of information has always been considered one of the most private elements of the private enterprise systems. But we do not believe that there is justification for this or any other employer's alleged fear that fact-finding boards "will ultimately become, through the process of evolution, the death of the American system of competitive enterprise." There is much more to be feared, in our opinion, from the adoption of a policy of noncoöperation, which will not only fail to solve our industrial-relations problems but will, in fact, increase them and make a none-too-friendly public even more mistrustful of business and its spokesmen than it is. Business men who want to preserve the private-enterprise system—or, at any rate, its best features—will do more toward attaining that goal by making some concessions to intelligent public sentiment in their industrial relations, just as they do in the design of their products, than by assuming an attitude of aloofness and indifference.

Run your eye over this wide range of

SCHRAMM
AIR COMPRESSORS
SIZES FROM 20 TO 420 CU. FT. ACTUAL AIR

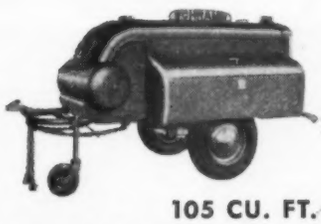
No. 20
ON SHOP TRUCK

The No. 20 compressor is a complete self-contained unit available in various types of mountings and with an actual air delivery of 20 cu. ft. per minute.



60 CU. FT.
DE LUXE WITH TOOL BOXES

The two wheel trailer type mounting is designed for rapid and inexpensive transportation behind truck or car.

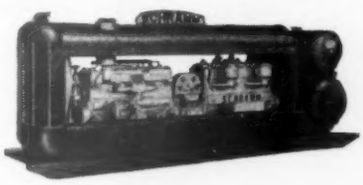


105 CU. FT.
WITH SWIVEL TYPE WHEEL

This trailer type mounting is provided with a universal coupling or towing ring for connection to car or truck for hauling at maximum towing speed.

105 CU. FT. WITH STREAMLINE FUEL TANK

A pneumatic tired mounting used generally for rapid transit over town and country highways. Lighter weight and better balance provide easier handling.

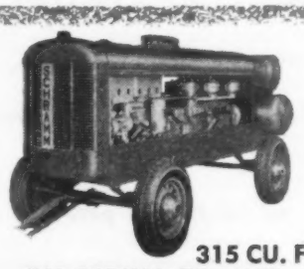


210 CU. FT.
STANDARD SKID MOUNTED

This unit is easily loaded on to a motor truck body for temporary use or for transportation, and can also be used for temporary or permanent stationary installation without addition of foundation.

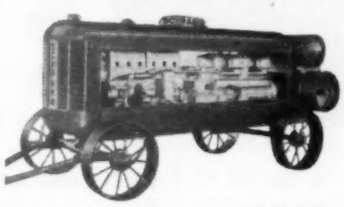
210 CU. FT.
MOTOR TRUCK MOUNTING

Any of the Standard self-aligned Schramm compressor units complete with streamline tool box and built-in fenders are available for mounting on truck chassis.



315 CU. FT.
ON SPRING TRAILER

The Spring Trailer, with pneumatic tires and semi-elliptical springs front and rear, is equipped with an automotive type steering assembly to provide perfect balance on any and all turns.



STEEL WHEEL MOUNTING

All size Schramm compressors are available in this type mounting with heavy, wide steel rims for easy portability in tough terrain.

420 CU. FT.
DIESEL ENGINE DRIVEN

Schramm Diesel Engine Driven units are available in sizes ranging from 105 to 420 cu. ft. of free air.

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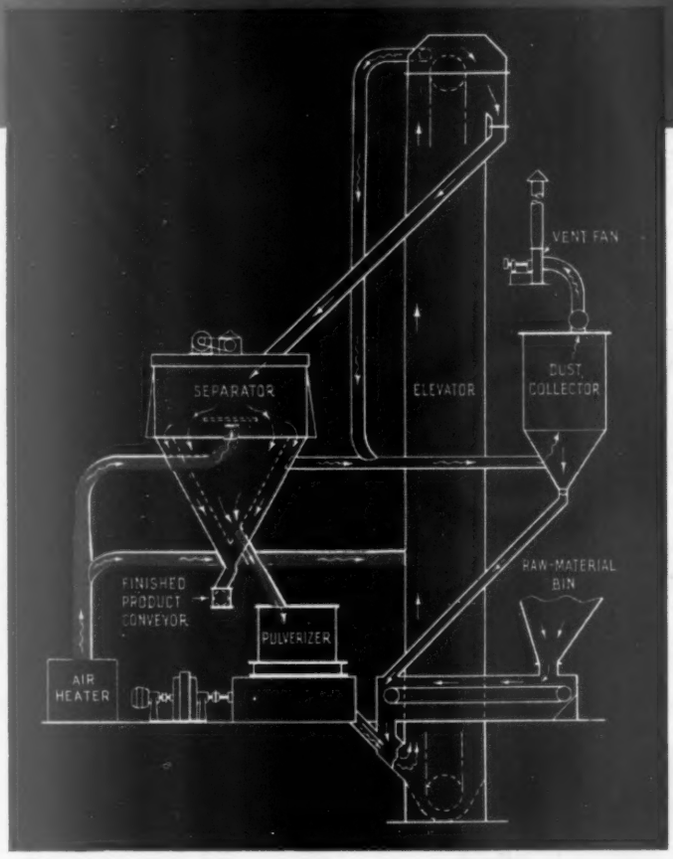
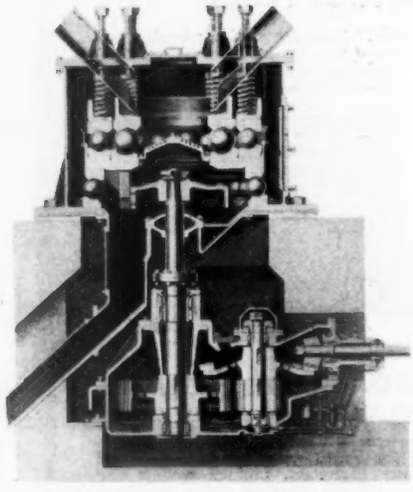
COMPRESSOR SPECIALISTS
WEST CHESTER
PENNSYLVANIA

DRYING AND GRINDING...

in ONE operation with the B & W Closed-Circuit System





- Eliminates separate drying equipment
- Reduces cost of kiln feed
- Substantial circulating load assures a well-blended product.

The Ball Bearing Principle of Grinding in the B&W Type B Pulverizer makes these advantages possible.

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Water-Tube Boilers, for Stationary Power Plants, for Marine Service . . . Water-Cooled Furnaces . . . Superheaters . . . Economizers . . . Air Heaters . . . Pulverized-Coal Equipment . . . Chain-Grate Stokers . . . Oil, Gas and Multifuel Burners . . . Seamless and Welded Tubes and Pipe . . . Refractories . . . Process Equipment.

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C 65

Carolinas Cement & Lime Co. Building $350,000 Plant At Harleyville, S. C.

Construction has begun on the lime plant of a new firm, the Carolinas Cement & Lime Company, at Harleyville, South Carolina, where an investment of about $350,000 is expected to be made by the company. The concern will make agricultural limestone and commercial lime and will also build a cement plant in the near future. Approximately 200 men will be employed when production begins. The projected cement plant will be the first to be erected in South Carolina, according to J. Ross Hanahan, president.

The new plant will be located adjacent to the Ancor Corporation's alumina plant, from which it was initially planned to use the by-product for cement. The Ancor plant has not been successful in producing calcium disilicate in sufficient quantities for this purpose, and the new company will accordingly develop other sources of raw material. There is no corporate connection between the two firms.

Other officers of the Carolinas Cement & Lime Co. are Charles F. Lewis, vice president and manager, and Thomas H. Carter, secretary-treasurer.

International Harvester Offers Harvest of Stars

An outstanding Sunday radio program, "Harvest of Stars," is on a nationwide N.B.C. network of 149 stations for the International Harvester Company, manufacturer of International crawler and wheel tractors, motor trucks, and farm equipment. This musical and dramatic program features Raymond Massey, stage and screen star, and a 70-piece orchestra—the largest sponsor's orchestra on the air—led by Howard Barlow. The program is heard every Sunday at 2:00 p. m., Eastern time.

The orchestra is accompanied by a 20-voice chorus directed by Lyn Murray. A top-rank guest star of stage, screen, and opera is featured on the program each week. Jan Peerce, Gladys Swarthout, Helen Jepson, and Bidu Sayao are among those in the entertainment field who have already appeared. The program has a historic American flavor, featuring America's rivers, mountains, and traditions, and the men, inventions, and institutions which have made it great.

Portland Cement Ceiling Raised in 11 States

Ceiling prices on all types of portland cement (except white cement) were raised 20 cents a barrel on December 11 in two producing and marketing areas. The increase, beginning at the manufacturer's level, is passed on to consumers. O.P.A. officials said that the action had resulted from increased manufacturing costs.

Affected by the order are the following states: Nebraska, Kansas, Oklahoma, Arkansas, western Missouri, Idaho, Montana, Wyoming, Utah, Colorado and New Mexico.

Home Front Accidents During 1941-45 Period Exceed War Casualties

Staggering figures released by the National Safety Council on home front accidents and fatalities during the war years indicate that 36,355,000 persons were injured or killed between December 7, 1941, and August 14, 1945. The statistics mean that 1 out of every 4 persons in the United States was injured or killed.

Compared with the war casualty figures, the home front accident toll is even more sensational. During the recent hostilities a total of 1,070,524 members of American service branches were listed as casualties. Broken down, the figures show:

Killed	261,608
Wounded	651,911
Missing	32,811
Prisoners	124,194

At home, in accidents of all kinds, the breakdown for the same period is as follows:

Killed	355,000
Injured	36,000,000

In accidents involving workers, the following facts have been revealed:

Killed on the job	66,000
Killed off the job	94,000
Injured	15,000,000

The rock crushing plant of the Material Service Company of Chicago at Williamsville, Illinois, has been dismantled and is being moved to Odell, Ill.

Coming Events

January 14-17, 1946—Chicago. Annual convention, American Road Builders' Association, Stevens Hotel.

January 22-24, 1946 — Cincinnati. Annual convention, National Sand & Gravel Association, Netherland Plaza Hotel.

January 23-25, 1946 — Cincinnati. Annual convention, National Ready Mixed Concrete Association, Netherland Plaza Hotel.

January 27-31, 1946—Chicago. Annual meeting, Associated Equipment Distributors, Edgewater Beach Hotel.

January 28-30, 1946 — Cincinnati. Annual convention, National Crushed Stone Association, Netherland Plaza Hotel.

January 29-February 1, 1946—Oklahoma City. Annual meeting, American Association of State Highway Officials.

January 31-February 1, 1946 — Cincinnati. First annual convention, Agricultural Limestone Division, National Crushed Stone Association, Gibson Hotel.

February 18-21, 1946—New York. Annual convention, American Concrete Institute, Statler Hotel.

February 25-28, 1946—Chicago. Annual meeting, American Institute of Mining and Metallurgical Engineers, Palmer House.

February 25-March 1, 1946 — Pittsburgh. Spring meeting, American Society of Testing Materials.

February 25-March 2, 1946—New York City. Twentieth exposition of Chemical Industries, Grand Central Palace.

June 24-28, 1946 — Buffalo. Annual meeting and exhibit, American Society for Testing Materials.

Colorado's Highway Plans Approved; Georgia, Illinois, New York Get Go Sign

A special session of the Colorado legislature adjourned on December 4 without adopting a proposal to submit to the people for a referendum vote a suggested 2-cent-a-gallon increase in the state gasoline tax to finance a long-range highway construction program.

The legislature made a compromise appropriation of $3,500,000 to finance part of the state's share of the 1946 Federal-aid highway construction program. This sum, together with highway funds on hand and anticipated, was said to be sufficient to inaugurate a $13,000,000 road construction program.

Governor Vivian had sought appropriations totaling $7,500,000 from the general fund for road financing in 1946 and 1947. The legislature took the position, however, that the $3,500,000 appropriation will be sufficient to tide the highway department over until the 1947 session, when it is expected the gasoline tax increase proposal will be revived.

A $32,000,000 road building program for 1946, the largest annual construction outlay in the state's history, was approved on November 26 by the Georgia State Highway Board. Federal funds will provide more than half the construction costs. The state has approximately $9,000,000 in federal funds held over since construction was halted by the war, and the state will receive $11,500,000 annually for the next three years from the federal post-war road program.

On November 21 the Illinois Supreme Court ruled the Illinois Superhighway Act of 1943 a "constitutional and valid statutory enactment," thus reversing a previous ruling by the circuit court of Sangamon County, which had declared it unconstitutional. In announcing its decision, the Supreme Court made the following points: that the act is complete and definite . . . and constitutional in its entirety; that it does not delegate unreasonable or arbitrary authority to the administrative commission; that contemplated tolls mentioned in the act are not taxes; and that it does not unconditionally amend any other act.

In New York State a 486-mile Thruway project was scheduled to go under construction at several points early this year. The first span will be on the Erie section; a second and a third on the Ontario Thruway; and a fourth on the Mohawk Thruway.

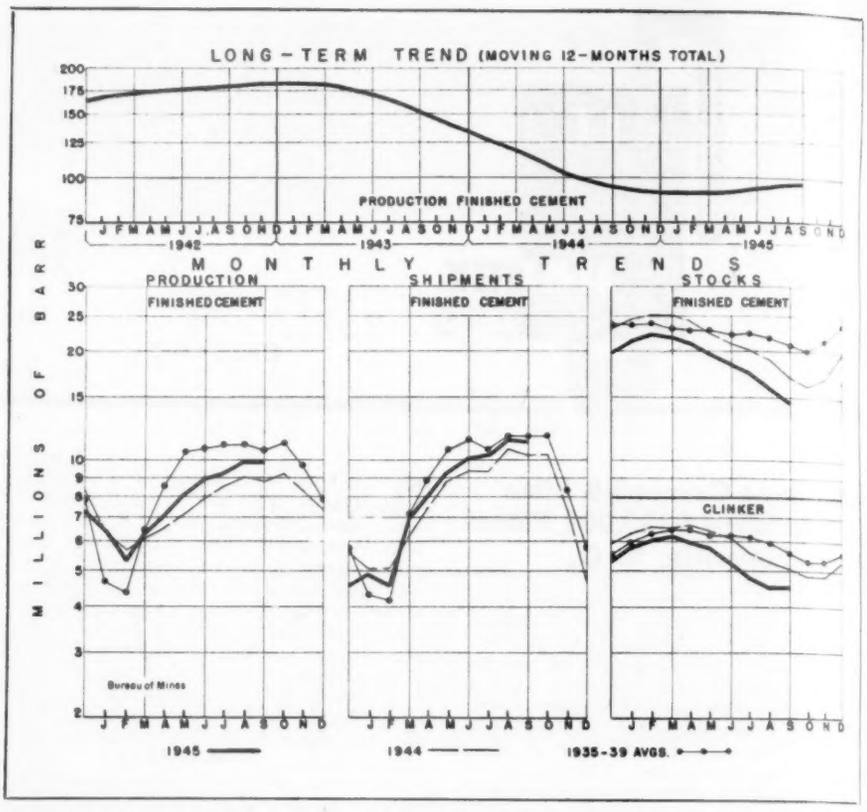
Craig, Bonadiman-McCain Processing Barite Ore

The Craig Mining Company, of which Will Craig is superintendent, has started milling barite at Cole Camp, Missouri. Material is obtained from the Craig mine on Indian Creek, and 100 tons of ore a day is being treated. The deposit is reported to be one of the richest barite occurrences in central Missouri; the crude ore averages approximately 30 per cent. barium sulphate, is essentially iron-free, and furnishes good chemical-grade barite.

Bonadiman-McCain, Inc., have installed additional equipment recently at the Spanish barite mine near Washington, Nevada, to increase output, now averaging 35 tons of ore daily, and develop additional reserves. The concern has undertaken a three-year production program and hopes to extract 160,000 tons of barium during the period.

The crude barite is being transported by a tramway at present, but as soon as a road-improvement program is completed, motor trucks will be used.

The National Lead Company recently announced the early construction of a barium-refining plant near Auburn, Calif.



Paralleling the increased rate of construction, the long-term trend of activity in the Portland cement industry, as indicated in the accompanying chart, continued its upswing in September. Production of 9,826,000 barrels of finished cement in September, 1945, reported to the Bureau of Mines, U. S. Department of the Interior, was 12 per cent. above the output reported in September, 1944. Mill shipments of 11,211,000 barrels, although 2 per cent. below the August, 1945, total, were 11 per cent. higher than those reported in September, 1944. The decline in mill stocks continued; the total of 14,581,000 barrels at the end of September, 1945, was 15 per cent. below that of the corresponding month of 1944, and 9 per cent. below the August, 1945, total. Clinker production in September, 1945, was 16 per cent. above that reported in September, 1944, and 2 per cent. above the August, 1945, total. Stocks at the end of September, 1945, were 11 per cent. below the figures reported for September, 1944, and 1 per cent. below that of August, 1945.

Contracts Awarded for $1,500,000 Granules Plant

Contracts for the $1,500,000 plant to be erected at College Station, near Little Rock, by the Minnesota Mining and Manufacturing Company of St. Paul, Minnesota, to manufacture roofing granules and other construction materials from Arkansas granite, have been awarded.

New Phosphate Operation To Be Opened in Florida

Plans for the development of a large modern phosphate mining operation have been announced by the International Minerals and Chemical Corporation of Chicago. Officers of the company revealed the purchase of a 2,000-acre tract near Bartow, Florida, which contains extensive phosphate rock deposits.

The firm also stated that the largest dragline ever built will be employed in the new operations. The bucket of the unit will have a capacity of 21 cubic yards.

Dominion Magnesium, Ltd. Buys Government Plant

Dominion Magnesium, Ltd., has purchased from the Canadian Government the magnesium plant at Haley's Station, Ontario, for $1,400,000, payable $100,000 in cash and the remainder at the rate of 1 cent per pound of magnesium sold. The Government is said to have spent $3,400,000 on the plant and Dominion Magnesium plans to spend an additional $500,000 for improvements and equipment.

Getting a paper out is sometimes fun, but it is never a picnic.

If we print jokes, people say we are silly.

If we don't, they say we are too serious.

If we clip things from other papers, we are too lazy to write 'em ourselves.

If we don't, we are too fond of our own stuff.

If we print contributions, the paper is filled with junk.

If we don't we don't appreciate true genius.

Now, like as not, some one will say we swiped this piece from some other paper.

WE DID.

Dodge Corp. Preview For 1946 Construction Indicates Sharp Increase

Even in the face of present retarding factors, the F. W. Dodge Corporation, fact-finding organization for the construction industry, estimates total dollar volume of new construction for this year as 50 per cent. greater than in 1945 in the 37 states east of the Rocky Mountains. The estimate for all 1946 construction in these states is $4,750,000,000, as against $3,160,000,000 expected for 1945 on the basis of the record for the first ten months of this year.

The corporation anticipates an increase next year of 20 per cent. over 1945 in nonresidential construction, with substantial increases in public and religious buildings in this classification. An increase of 178 per cent. in residential construction, with a total next year of $1,350,000,000 in the Eastern states is estimated.

Three kinds of retarding factors were mentioned as delaying revival. These are increased costs and current confusion about market conditions, continuing government controls so far as prices and rents are concerned, and the growing pains of an industry called upon to expand its operations very suddenly.

While the War Production Board on October 15 abolished all L-41 orders, which limited construction to types needed in the war effort, the O.P.A. price and rent controls remain a retarding factor.

According to Dodge, "Price controls, highly desirable in theory, have acted in some degree to retard production of needed materials. The O.P.A. has reluctantly granted some increases in ceiling prices to permit manufacturers to offer the increased wages necessary to recruit adequate manpower. The process for securing approvals for increases is frequently drawn out, and the continued effectiveness of price control in a peactime market is an open question.

"Rent control is a deterrent to new rental projects. The O.P.A. has been petitioned to exempt from rent ceilings all new rental housing, as a sound measure to encourage this much-needed class of building . . ."

Manpower in the designing, building, and materials and equipment fields is still comparatively scarce; but, according to Dodge's interpretation, this condition is not likely to last very long.

Road Builders to Hold 43rd Annual Convention

For the 43rd time, members of the American Road Builders Association will meet to hold their annual convention on January 14. Convention headquarters will be at the Stevens Hotel. Sessions will end on January 17.

Lodi Fertilizer Company To Open New Operation

Extensive expansion plans now are being put into effect at the Lodi Fertilizer Company of Lodi, California, a subsidiary of the Sanguinetti Fruit Company. Machinery for a new operation at Zenobia is about to be installed.

Since September, 1945, the firm has been shipping about 60 carloads of calcareous marl a month from its deposit on the Pyramid Lake Indian reservation in western Nevada. The company anticipates a minimum production of 20 carloads daily from the Zenobia location. At present, it has under lease 400 acres, on a royalty basis, from the Indian Bureau at Pyramid Lake, in addition to 470 acres in the Sand Pass area.

Work is to be started immediately on extensive phosphate holdings of the company in northern Utah. Lodi Fertilizer has made a commitment of 50,000 tons yearly with the U. S. Indian Bureau, to be distributed to several reservations in the West. In addition, 50,000 tons per year are expected to be produced for commercial consumption.

Highway Officials Hold Postponed 1945 Meeting

At a meeting of the executive committee of the American Association of State Highway Officials held in Chicago on October 24, it was decided to schedule the association's postponed 1945 annual convention at Oklahoma City. Dates announced were January 29 to February 1, 1946. The annual meeting is usually held in November.

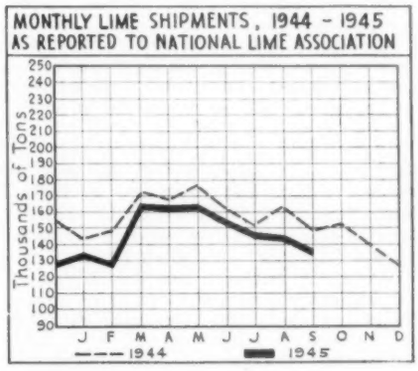
National Gypsum Company Acquires Rock Wool Plant

An important milestone along the National Gypsum Company's post-war expansion was reached when the firm acquired a modern rock wool plant at Mansfield, Massachusetts. Located almost in the center of the New England building distribution area, the plant will serve six states which are heavy consumers of wool insulation.

The Mansfield plant, built in November, 1944 by F. C. Brodie and G. K. Willis, veteran rock wool producers, will be further enlarged and expanded. A new cupola has been added to the original two, and other equipment has been ordered. To prepare adequately for a growing market, National Gypsum has already allocated $170,000 for financing the improvements.

Optimistic Forecast Made for Building Industry By A. G. C. President

According to H. A. Dick, president of the Associated General Contractors of America, the outlook for construction activity in 1946 indicates an upward trend in volume. Mr. Dick announced that his organization had set an objective of post-war construction at the rate of $12,000,000,000 annually, beginning next August. He is confident that American industry can meet the challenge if harmony is restored and maintained between labor and management, despite the material and manpower shortages and threatened rising prices.



According to data collected by the National Lime Association, 53 companies in September, 1945, shipped 136,834 tons of lime (84,108 quicklime; 52,726 hydrate). Reporting companies represent 42.9 per cent. of the association members' total capacity of record. Based on PIT AND QUARRY'S estimates for the remainder of the industry, the total shipments for the month by all plants were approximately 351,000 tons. Shipments of lime by users for September, 1945, were:

Use	Quicklime (tons)	Hydrate (tons)
Agricultural	1,278	11,584
Building	7,552	17,825
Chemical	75,278	23,317
Total	84,108	52,726

Grading and landscaping are combined with stripping operations by the American Aggregates Company's plant in Columbus, Ohio. The illustration shows 2 LeTourneau Tournapulls cutting away 12 to 18 inches of overburden. The two units haul up to 2,600 feet per round trip. Note the dragline working in the pit (background), which eventually will become a lake.

Construction Under Way At Natl. Gypsum Plants In Big Expansion Project

Progress made in the execution of the National Gypsum Company's expansion program (mentioned in the November issue of PIT AND QUARRY) as described in a recent company bulletin, includes interesting particulars on several plant additions. At Mobile, Alabama, a $900,000 project is under way for improving the product and increasing production; additions at Savannah, Georgia, Rotan, Texas, and Fort Dodge, Iowa, are being constructed at the cost of $1,500,000; and another $250,000 will be spent for process improvement and extensions at the firm's three rock wool plants and for the rehabilitation of the Portsmouth, New Hampshire installation.

The largest and newest of all the company's plants will be built from completed designs at Baltimore. Officials estimate that it will be ready for production by the end of 1946.

At Kerns, Virginia, a new lime processing plant is a duplicate of the double 450-foot rotary kiln operation at Bellefonte, Pennsylvania. The extensive limestone deposits at Kerns were purchased in 1944 from the Kimbalton Lime Co.

Altogether, the new production facilities will boost National Gypsum's annual production from the wartime level of $27,000,000 to $40,000,000.

Two 10,000-ton vessels purchased by the National Gypsum Company from the Canadian Government will be used to transport gypsum rock from the company's Nova Scotia quarries to plants at Portsmouth, New Hampshire, New York City, Savannah, Georgia, and Baltimore.

Highway Research Board To Meet at Oklahoma City

The 25th annual meeting of the Highway Research Board is scheduled to be held January 25 to 28, at the Skirvin and Skirvin Tower Hotels in Oklahoma City. Topics to be discussed include design, materials, maintenance, traffic and operations.

Great Lakes Carbon Corp. Buys Kittitas Diatomite Co.

The Kittitas Diatomite Company, with plant and deposit located at Kittitas, Washington, has recently been purchased by the Dicalite Division of the Great Lakes Carbon Corporation, which concern is now rebuilding the plant.

The raw material is a white diatomaceous earth, trucked from the deposit to the plant, a distance of about 12 miles. After the over-burden has been stripped, the material is broken up with a rooter, recovered by a LeTourneau Carry-all scraper and loaded into the truck by drag-line. At the plant the material is pulverized, dried and sized by air separation to various degrees of fineness. Much of it is packed in 50-pound paper bags by a St. Regis packer and sold principally to the paper, paint and insecticide-manufacturing industries. After improvements are completed, the output is expected to reach 80 to 100 tons daily, according to C. F. Schuholz, the new superintendent.

Acquisition of the Kittitas concern is another step in Dicalite expansion program. The concern recently acquired and rebuilt the plant of the U. S. Diatom Company at Basalt, Nevada. (See PIT AND QUARRY, August, 1945, page 58.) R. W. Yocum is now superintendent of operations at Basalt.

1944 Sand-and-Gravel Output at Pre-War Level

Sand and Gravel, a U. S. Bureau of Mines publication printed separately as a bulletin, represents one chapter from the *Minerals Yearbook* for 1944. The compilers are G. W. Josephson and G. E. Tucker. It was shown that the output of sand and gravel declined to the pre-war level in 1944. Production of sand and gravel was about 17 per cent. lower than in 1943, but industrial sands attained a new record. At the time of compilation, before V-J Day, the outlook for sand and gravel indicated a further slump in production, due to a decline in war construction and delays in authorization of civilian building.

The Pit and Quarry Directory lists all the important nonmetallic minerals producers, both alphabetically and geographically. It is distributed free only to those listed in it. To all others the price is $15.00 per copy.

500,000 Building Units Requested of F.H.A. In Post-War Program

Applications for nearly 500,000 units of public housing requested as a three-year program have already been filed with the Federal Housing Authority by urban communities and rural areas which have active housing authorities, F.H.A. Commissioner Philip M. Klutznick stated recently. The applications consist of 355,599 units requested by 335 urban localities and 141,473 units requested for 282 rural counties.

The pending Wagner-Ellender-Taft Housing Bill (S. 1592) would increase authorizations for annual Federal contributions to communities by $22,000,000 a year in each of the first four years after its passage, permit additional public housing for urban areas at the rate of about 125,000 units a year, and authorize Federal contributions over a five-year period for 38,000 rural housing units each year.

Visiting Spanish Engineer Tells of Cement Demand

Jose Ferrer-Vidal, chief engineer of the "Asland" Portland Cement Company, Barcelona, Spain, is in this country to arrange for the purchase of new equipment for his company's 5 plants.

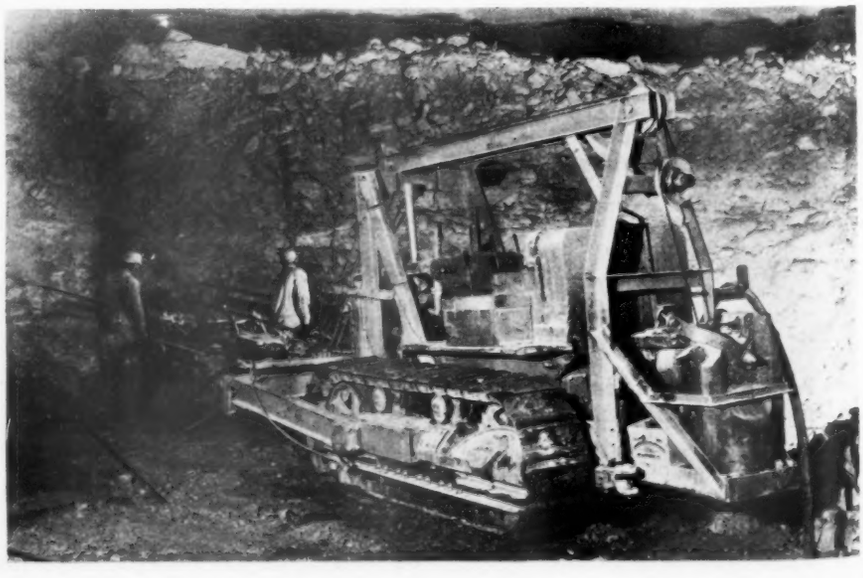
In talking to members of PIT AND QUARRY's editorial staff, Mr. Vidal said that the demand for cement in Spain is high and has been all during the war. In common with other European countries, however, there is a shortage of good coal, and this is holding down the production of Spain's 23 cement plants.

Limestone Producer Installs Labor and Time Saver

At the Stewart Sand & Material Company's limestone operation near Independence, Missouri, a Sullivan long-feed drifter drill, mounted on a Caterpillar track-type tractor, shown below, was recently installed. (The installation was made after the publication of an article describing the Stewart plant in the August, 1945, issue of PIT AND QUARRY.)

The self-propelled, tractor-mounted outfit replaces a wagon-drill mounting and jackhammer. The method of drilling horizontal blast holes in the facing is said to have saved many hours of hand labor. The 16-foot boom for the rig is made by Rogers Iron Works of Joplin, Missouri.

The two 1,000-pound drills produce holes 16 feet into the facing; and approximately 500 tons of material are broken loose with each shot. Material is then loaded into trailers with a 1-cubic-yard shovel and hauled to the crusher. Another track-type tractor, equipped with a bulldozer, is used to clean up and to spot gondola cars at the plant.



W.M.R. Director Snyder Reports to Pres. Truman; Submits 6-Point Plan

A report on housing, in the form of a memorandum, was presented to President Truman recently. Compiled by John W. Snyder, Director of War Mobilization and Reconversion, this memorandum set forth the findings of that government agency after investigation of the current national housing crisis, and also suggested to the President possible means of alleviating the pressure being brought to bear by returning service men who are unable to establish homes because of the lack of facilities. In this report, Mr. Snyder advises that his agency is doing all that is in its power to execute a six-point program designed to facilitate the solution of this pressing problem. The six objectives of the War Mobilization and Reconversion agency are as follows: 1) To increase the supply of building materials; 2) To strengthen inventory controls to prevent hoarding; 3) To strengthen price controls over building materials; 4) To discourage unsound lending practices and speculation; 5) To enlist industry support in increasing production and fighting inflation; 6) To provide information and advisory service on home values to the public. An additional three-point program, which this agency is backing, consists of releasing surplus building units and building materials held by the government, establishing priorities on building materials, and price control or ceiling prices on old and new housing.

As a result of the combined efforts of executive agencies under these programs, the supply of many building materials has shown a sharp increase while others are still in need of expediting before they can assist in the present situation. In locations where more production is needed, price increases, special manpower recruiting by the United States Employment Service, priorities and allocation of machinery and materials have proven effective. The establishment of priorities on building materials which is a regulation now being prepared and expected to be released in December, speeding up the release of housing and building units held by the government, utilization of war-time housing in areas now more urgently in need, the location and immediate sale of government surpluses, and Congressional appropriations for financial aid, are steps to be taken to stabilize the supply and demand for housing.

The institution of priorities for single and multiple housing units costing $10,000 or less per unit and ceiling prices on old and new housing indicate that about 50 per cent. of all building material will be channeled into this type of building. The balance will be available for commercial, industrial, higher-priced dwellings, and all other construction, both public and private. The regulation is to be issued under the Second War Powers Act which is said to be one reason that it is necessary to extend this Act for a full year after December 31, 1945, as the six months extension, as provided in the House bill, is too short a time to meet this emergency need. Mr. Snyder also states that in order to achieve effective results, his agency will require the combined cooperation of Federal, state, city, and community governments as each has specific problems to solve for the general cause. The amending of obsolete building codes in many communities was said to be necessary in order that substitute materials could be used.

It is with this thought of coordination between all the agencies, industries, and communities involved, that Mr. Snyder recommends to President Truman that a housing expediter be appointed to coordinate and expedite the housing program.

New Permanente Quarters In Company's Own Building

The administrative offices of the Permanente Cement Company and the Standard Gypsum Company of California are being moved to the 11-story Kaiser Building in Oakland, California, a structure acquired by the Henry J. Kaiser Company in July, 1944. (See PIT AND QUARRY, October, 1945, page 64.)

The Kaiser Building in Oakland, California.

Company officials announced that Permanente will occupy the seventh floor of the building, which was purchased from the San Francisco Bank by the firm.

General Manager Carl R. Olson has already moved into the new headquarters; and the sales department, now located in the Latham Square Building in Oakland, will make the change as soon as office renovations have been completed.

Correction

A part of the text of a news item in the November issue of PIT AND QUARRY concerning four new kilns at Sociedad Cemento Juan Soldado, S. A. (page 68), was unfortunately omitted. The missing information, for which another line was incorrectly substituted, indicated that the kilns were all 8 feet and 9 feet, 6 inches in diameter.

Illinois Leads Union in Commercial Sand Output

According to the University of Illinois Bureau of Economic and Business Research, Illinois in 1944 led all other states in the production of commercial sand. The 1944 total valuation of sand for Illinois was $4,943,000, for 3,331,000 tons. Ten companies are operating plants in the Ottawa area, where deposits of St. Peter sand are available.

November Building Trend Shows New Upswing In States East of Rockies

The F. W. Dodge Corporation has reported that contracts were awarded in November for 10,953 new dwelling units to cost $72,577,000 in the 37 states east of the Rocky Mountains. This was the largest number of new units to figure in contracts awarded in a single month since December, 1943, and the largest monthly dollar volume for such construction since June, 1942.

While contracts in both December, 1943, and June, 1942, involved a considerable amount of public housing, only 1 per cent. of November's total fell into that category. The November dollar volume of privately-owned residential building exceeds that for any month since April, 1942, the corporation reported.

Contracts were awarded in November in the Eastern states for 15,481 new construction projects of all kinds, involving an expenditure of $370,087,000. Of this total $207,671,000 was for nonresidential building, principally structures to be used for manufacturing purposes. November construction advanced 17 per cent. above October's total and was 124 per cent. higher than in November, 1944.

Dollar volume of all construction contracts in the 37 Eastern states during the first eleven months of 1945 totaled $2,968,618,000 compared to $1,805,535,000 in that period of 1944.

WLB Announces Ruling On Vets' Job Grievances

In two decisions affecting six cement companies in Pennsylvania, the National War Labor Board directed that any difference of opinion as to the application of the Selective Service Act to returned World War II veterans is to be considered as a grievance and should be handled according to the procedure for settling grievances set forth in the contracts or agreements between the companies and the unions involved. However, the Board provided that its decisions should not be construed as depriving any rights under the Act and its interpretations. Industry members of the Board dissented.

The companies involved were: the Alpha Portland Cement Company of Easton, Pennsylvania; the Lehigh Portland Cement Company of Allentown, Pennsylvania; the Lone Star Cement Corporation, the Nazareth Cement Company and the Pennsylvania Dixie Cement Corporation (plants 4, 5 and 6), all of Nazareth, Pennsylvania; the Universal Atlas Cement Co., Northampton, Pa.

$7,000,000 Highway Program Planned for Puerto Rico

Highway improvement plans for Puerto Rico were crystallized after the recent visit to the island of a United States Federal Works Agency commission; and work will begin early in 1946 on a $7,000,000 program. Plans prepared by engineers of the Department of the Interior were studied in San Juan and details were discussed by the commission members before they reported to the F.W.A.

The government of Puerto Rico will provide about $4,000,000, which will be supplemented by a $3,000,000 United States Government contribution.

WASHINGTON NEWS LETTER

FROM an economic point of view the year ahead holds considerable promise as well as a fair share of danger. The promise is easy to understand—it lies chiefly in the tremendous war-time advances in technology which can be applied to peace-time purposes, and in the proved productive capacity of the economy to provide full employment and a higher standard of living than before the war. This is the first requirement of prosperity. The real volume of consumption, which determines the standard of living, may depend upon national purchasing power, but consumption in turn is limited by the supply of goods available. In the first half of 1945 the United States had enough plant and equipment, materials, and labor to produce at an annual rate a total of more than $200 billion worth of goods and services at the price level then prevailing, yet even then we did not utilize our resources to the full. The productive efforts of the 12,000,000 men in uniform were not tapped and the shortage of civilian manpower prevented the maximum utilization of industrial facilities. Between 1939 and 1944 such facilities were increased by over one-third, even after allowing for plants such as shipyards and aircraft facilities which have limited peace-time use, and the intensive training of millions of previously unskilled workers has added greatly to the productivity of the labor force. From the physical standpoint it is clear that we have in abundance the means of production for providing a sizable increase in living standards over pre-war levels.

The key question—how to stimulate enough purchasing power to keep consumption at the high levels necessary to bring forth full production—is the one that stumps the experts. It is agreed that the answer will not be found in any one-year program, but much can be done in the coming twelve months to aid or defeat that objective. For example, there is by now, general recognition of the inflationary dynamite stored up during the war years in the form of highly liquid assets. Savings which were very small before the war have been increased by over $150 billion and the volume of currency in circulation is now about five times what it was in 1939. Barring inflationary dissipation these accumulations will tend to support consumer spending at relatively high levels in the immediate post-war years and would also have a stabilizing effect on the economy by offsetting deflationary developments. Government officials note with alarm that the explosive potential of the economy has been accentuated by the speculative boom in securities and real estate and the unremitting pressure on the Office of Price Administration to increase or eliminate price ceilings. These factors have a compounding effect on the inflationary situation. Thus, the stock market boom, which only adds to the fires, stems in part from general optimism concerning future business profits but, in even greater measure, trading appears to be based upon the expectation of a sharp price inflation in the near future. Similarly, the pressure on the O.P.A. has been accompanied in a number of important cases by a withholding of goods from the market, again because of hopes or expectations that price ceilings will be broken, and the consequent reduction in supply adds still another spark to the explosive atmosphere.

* * *

The probability is that the O.P.A. will hold its ground. Since the end of the war Chester Bowles has fought heroically to forestall a repetition of the wild and disastrous inflationary experience of 1919-1921. In the first rush to strip away war-time controls, he received little support from other government agencies, but subsequent events have so clearly vindicated his position that there is now unanimous Administration support for the continuation of price and rent control beyond the present expiration date of June 30. In fact, immediate extension has been requested in order to combat the inflationary psychology of the market and to pry frozen supplies loose from the hands of producers and wholesalers. Even the President's program for the restoration of home-building priorities and the imposition of price ceilings on housing bears out Mr. Bowles' early pleas for such a program on which he was overruled in a behind-the-scenes battle royal last October by the War Production Board (now superseded by the Civilian Production Administration) and by Reconversion Director Snyder.

Closely associated with the inflationary problem is the prospect of protracted labor-management disputes in all the major segments of industry. Granted that the shortest road to a restoration of free markets is "production, production, and more production," it is obvious that a satisfactory solution to strikes and lockouts during the reconversion period is a cardinal economic necessity. For this reason the failure of the recent labor-management conference to evolve any kind of mechanism for settling disputes was disappointing to government officials. If it is reasonable to premise a high degree of public responsibility in the settlement of industrial disputes vitally affecting reconversion, then the President's fact-finding plan, objectively viewed, makes a great deal of sense, even if it is only a partial answer and despite the objections of both labor and management groups. Labor's sincere concern that any such legislation would serve as a wedge for more drastic control of unions in the future may be based on keen political insight, but is not an adequate answer. Law or regulation of any kind is also in a sense an entering wedge for complete regimentation, but worldly people no longer recommend anarchy as the appropriate safeguard. Similarly, in this case the proposal must be judged on its merits. The strong opposition of many companies toward revealing to the public information on their operations also carries some weight, but in the absence of a satisfactory alternative, this argument is basically weak. No investigating body, whether under the President's plan or any other, can be effective or impartial without complete access to the pertinent facts, and since current and prospective wage disputes revolve fundamentally around the financial position of industry and its ability to pay, reference to accounting records would appear to be the only sensible solution.

* * *

If the fact-finding panels restrict themselves to ascertaining the facts, they will serve the very useful function of providing a sound basis for public opinion. But to the extent that they make specific recommen-

(*Continued on Page* 86)

NECROLOGY

THE beginning of a new year finds many personalities well known in the nonmetallic mining industries missing from among their associates. The following were among those whose passing PIT AND QUARRY recorded during 1945:

CHARLES G. ADAMS, 43, operations manager, Basic Refractories, Inc., Cleveland.

H. P. BENNETT, 70, founder and president, Bennett Concrete Stone Company, Cleveland; president, Hugo Sand Company, Kent, Ohio.

WILBERT BIVINS, 70, president, National Pulverizing Company, Millville, New Jersey.

BERTRAND BLAIR, founder and operator of first concrete-tile industry in Ontario, Canada; past president, the American Pipe Manufacturers' Association.

LOUIS BROOKMAN, JR., 53, publisher of *Concrete*, Chicago.

LEO BROWN, 45, manager, Illinois Silica Sand Company plant, Ottawa, Illinois.

EARL A. BURR, 66, vice-president, Cleveland Quarries Company, Cleveland.

WALLACE L. CALDWELL, founder and president, Alabama Asphaltic Limestone Company, Birmingham; past president of the Associated Industries of Alabama and Kentucky Rock Asphalt Company of Louisville; inventor of a light-weight slag machine.

H. B. COBBAN, 67, president, Miami Rock Products Company, Miami, Oklahoma; president, Northeast Oklahoma Railroad Company.

CHARLES F. CONN, 80, chairman of board of directors and former president, Giant Portland Cement Company, Philadelphia.

JOHN D. CRONENWETH, 64, chairman, Great Lakes Foundry Sand Company, Detroit.

AUGUSTUS E. DICKINSON, past president, Indiana Limestone Company.

WALTER S. DILLS, president, Yahola Sand & Gravel Company, Muskogee, Oklahoma.

E. C. DRESSER, 71, proprietor, Dresser Sand Company, Leavenworth, Kansas.

EUGENE ENLOE, 86, president, Idaho Portland Cement Company, Inkom, Idaho.

GUY O. GARDNER, 57, production manager and research director, Ash Grove Lime & Portland Cement Company's plants in Kansas, Missouri, and Nebraska.

LESLIE M. HANSEN, 55, president, Industrial Silica Corporation, Youngstown, Ohio.

HANS MADISON HANSON, 58, assistant superintendent, Northwestern States Portland Cement Company, Mason City, Iowa.

DR. FRED A. HARVEY, 63, director of research, Harbison-Walker Refractories Company, Pittsburgh.

FRANK G. HINMAN, 71, president, Hinman Asbestos Corporation, Cambridge, Massachusetts.

JOSEPH HOCK, 72, president, Consumers Company, Chicago.

FREDERICK A. HOEFER, 70, president, Southern Silica Mining and Manufacturing Company, Columbia, South Carolina.

C. B. IRELAND, vice-president, Birmingham Slag Company, Birmingham; president, Montgomery Gravel Company, Montgomery, Alabama.

JOHN E. KELLEY, superintendent, Warner Company's McCoy plant, Swedeland, Pennsylvania.

ALBERT M. MEANOR, 87, founder and president, River Sand & Gravel Company, Cheswick, Pennsylvania; founder, Valley Sand & Gravel Company, New Kensington, Pennsylvania.

NEIL I. MCARTHUR, 55, vice-president, Great Lakes Foundry Sand Company, Detroit.

EUGENE H. MCEUEN, 59, supervising engineer, Chubbuck Lime Company, Los Angeles.

NELSON E. MCLOON, 70, superintendent, Glencoe Lime & Cement Company, St. Louis.

EUGENE H. MILNER, 50, vice-president and general manager, Mississippi Lime Company, Alton, Missouri.

HARRY H. MITCHELL, 85, vice-president in charge of finance, General Crushed Stone Company, Easton, Pennsylvania.

NATHAN E. NEWMAN, 62, president, Asbestos Ltd., New York City and Millington, New Jersey.

ALBERT E. O'NEIL, 57, former secretary-treasurer, Aetna Portland Cement Company, Bay City, Michigan.

O. F. POINDEXTER, 46, economic geologist, Michigan Geological Survey.

CHARLES A. PORTER, 76, former vice-president and superintendent, Lawrence Portland Cement Company, Boston; founder, Alliance Cement Block Company, Northampton, Pennsylvania.

H. H. PURKHISER, 59, superintendent, Lehigh Portland Cement Company, Mitchell, Indiana.

BEN D. REYNOLDS, president and manager, Independent Gravel Company, Joplin, Missouri; past president, Calcium Carbonate Company, Chicago.

ALLAN V. RITCHIE, 59, superintendent, Texas Company research laboratories, Beacon, New York.

GEORGE T. SEABURY, 65, secretary and executive director of American Society of Civil Engineers; president of Engineering Societies Personnel Service, Inc.; vice-president of American Engineering Council.

LAURENCE L. SNOUFFER, 42, president, J. and L. Snouffer, Inc., Dublin, Ohio.

HARRY F. SPIER, president and general manager, New Jersey Pulverizing Company, New York City; charter member and director of Industrial Sand Association; former general manager, Pennsylvania Pulverizing Company, Lewistown, Pennsylvania.

ARTHUR E. STANGER, 69, vice-president, Whitehall Cement Manufacturing Company, Philadelphia.

CLAUDE L. WAGNER, 58, vice-president, Superior Portland Cement Company, Seattle.

A. O. WALKER, vice-president and general manager, Muskogee Materials Company, Muskogee, Oklahoma.

WALTER G. WARE, 71, former operator, J. R. Ware Sand & Gravel Company, Cincinnati.

STEPHEN E. WILLEY, owner and operator, Willey-Ruckstuhl Company, Miamitown, Ohio.

WILLIAM J. YOUNG, 80, former engineering department head, Standard Lime & Stone Company, Baltimore; former consulting engineer, Alpha Portland Cement Company, Easton, Pennsylvania.

Additional notices of deaths which have occurred recently will be found on page 122.

Among minerals for which acute civilian shortages are reported are mica and graphite. In the muscovite splittings grade of mica the deficiency amounts to 4,300,000 pounds for a six-month period. For the block and film grade, the civilian shortage is estimated at 1,595,000 pounds, government stocks amounting to 3,090,342 pounds.

Graphite of all classifications over a six-month period is estimated to be 5,300 tons short for civilian stocks, as against the Reconstruction Finance Corporation's supply of 2,477 tons.

Envision $3,000,000,000 Highway Plans For Post-War Traffic Needs

The Men Who Supply the Materials That Go into the Construction of Modern Highways Have Busy Years Ahead of Them,

By Thomas H. MacDonald,
Commissioner of Public Roads, Federal Works Agency, Public Roads Administration

another P&Q exclusive

BROAD plans have been developed by state highway departments and the Public Roads Administration for the improvement of thousands of miles of primary and secondary roads and the construction of expressways in urban areas. With the opening of the next construction season a beginning will be made on the largest highway program ever undertaken by any nation.

Most of the States have formulated plans for programs covering a five-year period, and in many states highway authorities are contemplating extensive improvements that will take 10 to 15 years to complete.

In quarries and gravel plants, in cement mills and oil refineries, workers will be required to produce large quantities in every section of the country.

Work on projects planned for the coming year should be in full stride by early summer if sufficient labor and materials are available and high prices do not check the letting of contracts.

Post-War Federal Program The scope and pattern of the post-war highway program were established by the Federal-Aid Highway Act of 1944, which authorized an appropriation of $500,000,000 in each of the three fiscal years following the end of the war to assist the states in constructing highways designed to meet modern traffic requirements.

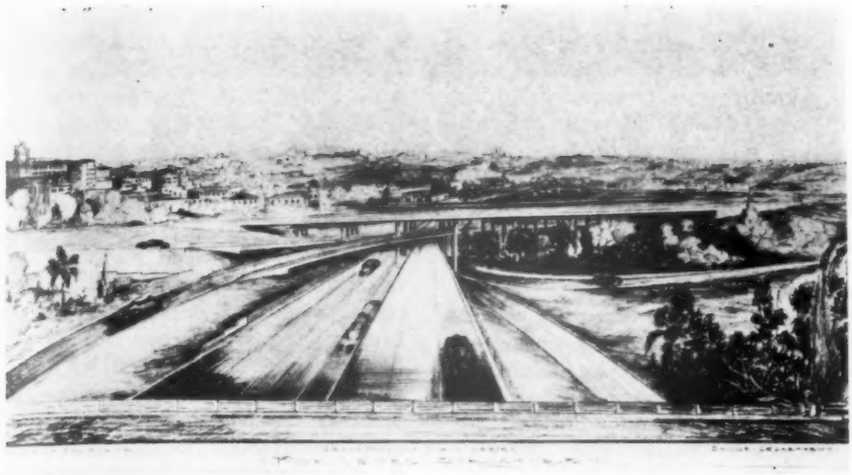
Under the provisions of the act, $225,000,000 of the annual appropriation will be expended on the principal highways that comprise the 232,000-mile Federal-aid system; $125,000,000 is earmarked for the improvement of Federal-aid routes in urban areas, and $150,000,000 is reserved for the development of a Federal-aid system of secondary roads in each state.

Since the Federal funds generally are matched in equal amount by the states, the legislation makes it possible for the states to undertake a $3,000,000,000 highway program, with Federal assistance, in addition to work that will be financed entirely with state and local funds.

State Co-operation The Federal-Aid Highway Act of 1944 has two significant features which are departures from previous highway legislation. It requires that the states cooperate with the Public Roads Administration in designating a national system of interstate highways, not exceeding 40,000 miles in extent, and that each of the states select a definite system of farm-to-market and "feeder" roads on which Federal funds will be expended.

The proposed national interstate highway system will serve traffic between the principal centers of population and at the same time will carry the heaviest concentrations of "local" traffic between metropolitan centers and suburban communities. Rural sections of the proposed system, for the most part, will coincide with the most heavily traveled routes in the present Federal-

Sketch of a section of the proposed 10-mile John C. Lodge Expressway in Detroit, which will carry six lanes of traffic. It will be completed at an estimated cost of $30,000,000.



A possible method of separating traffic at heavily-congested points is illustrated by this design for a four-level structure, developed by the Bridge Department of the California Department of Public Works.

aid system, but some relocations will be necesstry to conform to modern construction standards and to provide more direct routes of travel.

All the states have submitted to the Public Roads Administration their recommendations for routes to be included in the national interstate system and standards of construction in general have been agreed upon. Minor differences concerning connections at state boundaries will be ironed out in conferences between representatives of the state highway departments and the Public Roads Administration, and it will be necessary to do some pruning of state recommendations to keep within the statutory limit of 40,000 miles.

National Interstate System The national interstate highway system, when finally mapped, will probably link all cities of 300,000 population and over, and nearly all cities in the 100,000 to 300,000 population group, as well as many smaller cities and towns. It will include expressways that will permit fast-moving traffic to reach the heart of cities without interference from "local" traffic on cross streets. In many instances circumferential routes will be built to enable through-traffic to by-pass the city and local traffic to reach outlying sections of the metropolitan area without passing through congested downtown districts.

From the viewpoint of the average motorist the development of the national interstate highway system, with expressways through large cities and broad divided highways in rural sections where traffic volumes are heaviest, will be the most dramatic feature of the post-war highway program.

Secondary System But the improvement of secondary roads also is important, whether considered as a means of transporting farm products with greater facility and improving rural social conditions or as a source of employment for unskilled and semiskilled workers.

The improvement of secondary roads was well advanced in many states and begun in others prior to the war. Under earlier legislation Federal-aid secondary-road systems or partial systems had been selected and approved for 35 states. The new legislation requires that a system of Federal-aid secondary roads, comprising farm-to-market roads, mail and school bus routes and other "feeder" roads be selected in all states except the few in which all public roads and highways are under the control of the state highway department.

The purpose of the legislation was to foster a more comprehensive rural road program through the selection and improvement of a system of principal secondary roads to supplement the Federal - aid highway system in rural areas. Together the two systems will form a closely integrated network of truck routes and "feeder" roads.

The roads to be included in the secondary system will be selected by the highway department in each state, in coöperation with the county supervisors or other local officials and the Public Roads Administration.

No specific limit was placed upon the mileage of secondary road systems, but the states were urged to include only such mileage as could be adequately improved within a reasonable period of time and maintained with revenues that may be expected to accrue.

Secondary roads do not require the high standards of construction that are necessary in building Federal-aid and state highways to serve heavy volumes of traffic. It is necessary, however, that principal secondary roads be designed to give year-'round service and that they have sufficient durability to be maintained at reasonable cost.

No single type of construction meets these requirements in all situations. Traffic volumes, climatic conditions and construction materials will vary greatly on different sections of the secondary road systems. But durable roads will be built.

An elevated section of Chicago's proposed Congress Street expressway and facilities for the distribution of express traffic to the Loop area are pictured here. This portion of the expressway will pass through a portal left for that purpose in the new Post-Office Building. The eight-lane highway, extending from the downtown shore of Lake Michigan to the western city limits, will be completed at an estimated cost of $45,000,000.

Urban Projects Highway projects planned for urban areas will bring about a striking transformation of transportation facilities in most of our large cities during the next five years.

The annual authorization of $225,000,000 over a three-year period will be available for projects on both urban and rural sections of the Federal-aid system. In addition the sum of $125,000,000 in each of the three years is specifically designated for the development of arterial routes in and near cities of 5,000 or more population. These funds offer our cities the opportunity to obtain modern thoroughfares on a scale never before attempted except in a few large metropolitan centers, such as New York and Chicago.

Many large cities are planning the construction of depressed or elevated expressways, with four to six traffic lanes, which will be designed to permit motorists to travel with a reasonable measure of safety at 40 to 50 miles an hour in congested downtown districts. Access to the expressways will be possible only at carefully selected points. In many locations expressways will be flanked by parallel frontage roads to accommodate local traffic. Where the expressway is depressed overpasses will be provided for cross-street traffic.

Availability of Funds Funds authorized by the Federal - Aid Highway Act of 1944 for the first year of the program have not yet been appropriated by Congress. In the first week of October the two branches of Congress adopted a concurrent resolution declaring that the war emergency had been relieved sufficiently to permit the states and the Federal Government to launch the highway program. This permits the states to incur construction costs with full assurance that the Federal Government will pay its share.

Inasmuch as Federal funds are considered spent when allotted to specific projects, the actual construction which ultimately will be financed in part from the initial $500,000,000 appropriation can, and probably will, extend beyond June 30, 1947.

A second Federal fund of $500,000,000 will be apportioned soon and will become available for construction next July. This will be subject to project commitments through June 30, 1948, with actual expenditure on construction continuing for some time after that date.

The third $500,000,000 Federal fund authorized by the Federal-Aid Highway Act will be released on July 1, 1947, and will be available to the states, on a matching basis, for commitments contracted during the next two fiscal years. Road-building operations financed from this fund may extend into the early months of 1950.

Thus, on the part of the Federal Government, all necessary financial provision has been made for a $3,000,000,000 program of construction to continue over a period of four years of more. The volume of work actually done will depend upon the ability and willingness of the states to finance their share of the cost.

State Plans It is encouraging to note, however, that a majority of the states recognize the need for modern highways and are actively coöperating with the Public Roads Administration in the development of plans for extensive improvements.

New York State, for instance, proposes to spend $840,000,000, including anticipated Federal aid, for the construction of arterial highways in the next five years. The projects will include a $202,000,000 six-lane express highway, 486 miles in extent, which will run from New York City to Albany and Buffalo, then south to the Pennsylvania State line. Work on the initial sections of the throughway is scheduled to start in the spring.

New York City has prepared plans for a $300,000,000 arterial highway and parkway construction program, with an estimated $102,000,000 to be expended in 1946. The projects include five expressways which will be constructed during the next three years.

Illinois has a 10-year highway program which calls for the construction of 32 miles of expressways, improvements on 221 miles of main highways and the construction of 21 new bridges. One of the major projects in this program is the Congress Street expressway in Chicago, on which work is expected to start in the next few months. The initial 8-mile section of this expressway, extending from the western city limits to the Lake Shore Drive, will be completed at an estimated cost of $45,000,000.

Pennsylvania is planning to spend $345,000,000 for highway work in the next five years; New Jersey is contemplating a five-year $125,000,000 construction program; the Connecticut State Highway Advisory Commission has recommended a $67,000,000 highway program extending over five years; Maryland is developing plans for a $60,000,000 program; Minnesota has plans for a $74,000,000 program on which work will begin this spring, and Mississippi proposes to invest $47,600,000 for highway improvements during the next three years.

The Texas State Highway Commission has approved plans for the improvement of 821 miles of primary roads and 2,162 miles of secondary roads in the coming 12 months, and has adopted a three-year program for the development of farm-to-market roads at an estimated cost of $60,000,000. California is considering a 10-year program which includes a 3,300-mile statewide system of arterial highways, to be built at a cost of approximately $600,000,000, and Oregon has plans for a $36,000,000 program which will extend over a three-year period, with the bulk of the contracts to be let during the next 18 months.

Similar programs that will involve a vast amount of road work in the years immediately ahead have been developed by other States. I have cited a few states to indicate the extent of the work that is being planned or, in a few instances, already is under way.

City Plans Detroit has developed plans for the construction of two controlled - access highways, the John C. Lodge Expressway, which will be built at an estimated cost of $30,000,000, including right-of-way, and the Crosstown Expressway, which will cost approximately $48,000,000.

Boston, Cleveland, Milwaukee, Cincinnati, Denver, Fort Worth, Dallas, Los Angeles, San Francisco and Portland, Oregon, are other large cities in which plans for express highways are well advanced.

In addition to the interstate and secondary highway construction that will form a large part of the $3,000,000,000 highway program authorized by the Federal-Aid Highway Act of 1944, there is in every state a large backlog of road projects and maintenance jobs that were deferred during the war years. Much of this work will be placed under contract in the next few months.

The highway planning surveys which were started by the states and the Public Roads Administration before the war, and are still contiuing on a reduced scale, will be helpful to the state highway departments in determining where the need for highway improvements is greatest

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U. S. LABOR BUREAU REPORTS ON PROPOSED CONSTRUCTION

Studies and Estimates in The Building Industries Reveal the Demand for Nonmetallic Minerals

By EDWARD M. GORDON

U. S. Bureau of Labor Statistics
Department of Labor

CONSTRUCTION is the principal outlet for materials in the broad field of stone, clay and glass products; in fact, combined with maintenance of structures it is the only significant market for many of these. The outlook for producers in this field is therefore closely related to the outlook for construction, with respect both to the volume which seems likely and to the characteristics of the construction operations.

On the basis of its studies and estimates in the construction field during the past generation, the U. S. Bureau of Labor Statistics has analyzed the effective demand for the major types of construction for the coming 5-year period. The resulting forecast is shown in Table I, which was prepared some months ago. Because of the time and manner of Japan's defeat, and because of subsequent developments in the preparation for construction work, the first 5 post-war years shown in the table may be regarded as equivalent to the years 1946-1950, inclusive. It should be noted that the forecast is expressed in terms of the value of projects or jobs started each year, rather than in terms of work performed. For 1948 this makes comparatively little difference, and for 1949 and 1950 very slight difference; but the rapid expansion of work in 1946 and 1947 means that unfinished work at the end of each year will be considerably greater than the previous year's unfinished work which was carried to completion at the beginning of the year. Hence work put in place will be less than work started by roughly 15 per cent. in 1946, and perhaps 8 per cent. in 1947.

Forecasts and Prices It should also be noted that this forecast is at 1940 prices rather than current prices. This is to provide a fixed measure of the volume, and does not imply that the construction price level is expected to return to that of 1940. The subsequent increases in wage rates and material prices have of course affected the in-place prices for different types of construction to different degrees, depending on the patterns of materials used and the occupational patterns for the site man-hours. The over-all effect of these changes on new construction (including additions, alterations, modernization and major repairs of

TABLE I—ESTIMATED VALUE OF PRINCIPAL TYPES OF CONSTRUCTION TO BE STARTED DURING THE FIRST 5 POST-WAR YEARS

Type of Construction and Source of Funds	Value (in millions of dollars)					
	First 5 Post-war Years					
	1st	2nd	3rd	4th	5th	Average
NEW CONSTRUCTION						
Total new construction; including additions, alterations, modernization, and major repairs[1]	7,890	10,870	11,805	11,990	12,065	10,924
PRIVATE CONSTRUCTION:	5,765	8,015	8,560	8,545	8,595	7,896
Residential (nonfarm)	2,850	3,900	4,250	4,300	4,450	3,950
New construction	2,300	3,100	3,400	3,500	3,700	3,200
Additions, alterations, modernization and major repairs	550	800	850	800	750	750
Nonresidential	1,530	2,400	2,550	2,550	2,450	2,296
Commercial	750	1,300	1,350	1,350	1,250	1,200
New construction	250	400	500	550	550	450
Additions, alterations, modernization, and major repairs	500	900	850	800	700	750
Industrial	500	700	750	750	750	690
New construction	300	400	450	500	550	440
Additions, alterations, modernization, and major repairs	200	300	300	250	200	250
Religious	100	150	175	175	175	155
Educational	60	75	80	80	80	75
Social and recreational	50	75	85	85	85	76
Hospital and institutional	50	75	85	85	85	76
Miscellaneous	20	25	25	25	25	24
Farm (residential and nonresidential)	425	525	550	550	500	510
Utility[2]	960	1,190	1,210	1,145	1,195	1,140
Railroad	350	400	350	350	350	360
Local transit	25	40	45	45	45	40
Pipe line	25	25	25	25	25	25
Electric light and power	250	300	300	300	350	300
Gas	60	75	90	75	75	75
Telephone and Telegraph	250	350	400	350	350	340
PUBLIC CONSTRUCTION:	2,125	2,855	3,245	3,445	3,470	3,028
Highway, road, and street[3]	900	1,200	1,400	1,500	1,500	1,300
Residential building	95	145	175	190	190	159
Nonresidential building	380	580	690	725	750	625
Educational	250	400	450	450	450	400
Hospital and institutional	45	70	80	90	90	75
Public administration	75	100	150	175	200	140
Commercial and industrial	0	0	0	0	0	0
Miscellaneous	10	10	10	10	10	10
Military and naval	100	75	50	40	40	61
Civil aviation	60	75	80	80	80	75
Reclamation, conservation, and development	275	325	350	400	400	350
Water supply	110	140	160	170	170	150
Sewage disposal	125	200	225	225	225	200
Social and recreational[4]	50	75	75	75	75	70
All other Federal	10	15	15	15	15	14
Miscellaneous non-Federal	20	25	25	25	25	24
MAINTENANCE AND MINOR REPAIRS						
Total maintenance and minor repairs	5,070	4,725	4,265	4,015	4,015	4,418
PRIVATE CONSTRUCTION:	4,005	3,675	3,330	3,180	3,180	3,474
Residential buildings	1,500	1,400	1,300	1,300	1,300	1,360
Nonresidential buildings	750	600	500	500	500	570
Farm	400	350	350	300	300	340
Utility	1,355	1,325	1,180	1,080	1,080	1,204
Railroad	1,000	1,000	900	800	800	900
Local transit	75	70	60	60	60	65
Pipe line	20	20	15	15	15	17
Electric light and power	100	90	85	85	85	89
Gas	30	25	20	20	20	23
Telephone and telegraph	130	120	100	100	100	110
PUBLIC CONSTRUCTION:	1,065	1,050	935	835	835	944
Highway, road, and street	800	800	700	600	600	700
Building (residential and nonresidential)	75	75	70	70	70	72
Reclamation, conservation, and development	75	70	65	65	65	68
Water supply	90	85	80	80	80	83
Sewage disposal	25	20	20	20	20	21

[1] Additions, alterations, modernization and major repairs of the type for which building permits are usually issued are included with new construction except where listed separately.
[2] Includes municipal and other publicly owned utilities except those constructed in conjunction with reclamation, conservation and development program.
[3] Includes culverts, bridges, grade separations, and other related work.
[4] Includes buildings and nonbuilding construction.

the type for which building permits are usually issued, but excluding maintenance and minor repairs) is as shown in Table II.

TABLE II—ESTIMATED VALUE OF NEW CONSTRUCTION TO BE STARTED DURING FIRST 5 POST-WAR YEARS, AT CURRENT PRICES
Value (in millions of dollars)

Type of Construction	Post-war Years				
	1st	2nd	3rd	4th	5th
Total new construction	9,755	13,440	14,655	14,835	14,900
Private construction	6,835	9,505	10,200	10,110	10,145
Public construction	2,920	3,935	4,455	4,725	4,755

As stated before, the work performed will be roughly 15 per cent. less than the work started in 1946, and about 8 per cent. less in 1947. Thus, the work performed is expected to be about $8.3 billion at current prices in 1946, and almost $12.4 billion in 1947. This means that 1946 will show an increase of almost 50 per cent. from 1945 (for which the preliminary estimate is about $5.7 billion) and that 1947 will show another increase of almost 50 per cent. from 1946. These are high rates of increase in activity, but entirely feasible in view of the small construction volume for 1945, the progressive improvement which may be expected in all supply factors, and the very great accumulated demand. The increase of about 7 per cent. in construction volume from September to October, 1945, in contrast to the usual seasonal reduction, is evidence that rapid expansion has already started.

Materials Needed All this coming work will require materials. It is estimated that the 5-year program, exclusive of maintenance and minor repairs, will mean consumption of about $26 billion in materials at 1940 prices, an average of more than $5 billion per year. Well over a fifth of this—almost $6 billion for the 5-year period—will be for materials classified in the stone, clay and glass group according to the standard industrial classification. The estimated distribution of these materials among the pit and quarry industries is given in Table III. This estimate is based on tabulations made by the Bureau over a period of about 12 years, from reports of materials used in several thousand different projects of the principal types.

The figures shown represent contractors' expenditures, which include transportation expense and the expenses and profit of distributors, as well as the value of the materials at the producers' plants. Each year's figures are for the materials required to complete all the work started during the year. Because of the common practice of blanket purchase of materials by contractors on award of contract, the estimates represent orders booked rather than deliveries made each year. This table does not include materials used in maintenance work. Estimates of the materials needed for highway, railroad, building and other maintenance have not been made, because of absence of sufficient data.

Use of Concrete Growing The largest single item of this lot will be cement, as would be expected, followed closely by sand, gravel and crushed stone. The group *concrete products* includes ready-mixed concrete, concrete block, factory-made concrete pipe, and the general range of factory-made concrete items. The estimate for this group is higher than would be obtained directly from past records of materials used for a number of reasons. There are indications that ready-mixed concrete, already used for the smallest paving jobs such as driveways and trucking areas, may be used for those city and suburban paving jobs where the size of the area, length of haul and traffic conditions are favorable. The shortage of bricklayers will encourage the use of concrete block, since a given area of wall is laid up more quickly with block than with brick. Precast architectural concrete has had sufficient use to show its possibilities; while it will remain among the minor materials, it is likely to be somewhat more prominent than in the past. Developments in materials, the general supply situation and the labor situation will, of course, affect the use of a great number of other materials as well, produced in industries outside the pit-and-quarry group.

The characteristics of the various types of construction will determine the pattern of materials used for each. While fundamentally unchanged, in several cases these characteristics will be perceptibly different from those of the same types as we have known them in previous periods of active construction.

Residential Building The largest single type of construction is privately financed nonfarm residential building. It is expected that an average of 850,000 dwelling units (exclusive of public housing) will be started annually, with an average construction cost of $3.2 billion per year at 1940 prices. These are likely to use a smaller quantity of stone, clay and glass products than would the same number of units built under the conditions of the pre-depression housing boom. For several reasons apartment buildings are not expected to provide more than 12 per cent. of the new dwelling units, in contrst to twice that percentage and more in the building period of the 1920's. Since these are the buildings using concrete and masonry extensively, this reduction in percentage means some reduction in the use of the corresponding materials. Two-flat buildings have been minor factors for some years, and will remain so.

It is expected that more than 700,000 of the dwelling units will be single-family houses, most of them built for sale. In accordance with local custom and land prices, some of these will be semi-detached or

TABLE III—ESTIMATED VALUE OF SPECIFIED TYPES OF MATERIALS TO BE REQUIRED FOR NEW CONSTRUCTION PROJECTS STARTED DURING FIRST 5 POST-WAR YEARS[1]

Materials	Value (in millions of dollars at 1940 prices)					
	Total[1] 5 Years	1946	1947	1948	1949	1950
All materials	25,909	3,750	5,134	5,589	5,690	5,746
Stone, clay and glass products	5,945	845	1,151	1,278	1,325	1,346
Cement[2]	1,636	235	316	349	365	371
Concrete products	1,043	148	205	227	231	232
Lime	62	9	12	13	14	14
Sand, gravel and crushed stone[2]	1,532	221	297	325	341	348
Other stone, clay and glass products[3]	2,015	281	389	438	450	457

[1] Excludes materials for maintenance.
[2] Includes cement or sand, gravel and crushed stone used in the manufacture of concrete products for construction use; hence the sum of the individual items exceed the total for stone, clay and glass products group by this duplication.
[3] Includes brick, structural tile, floor and wall tile, terra cotta, glass and glass products, plaster, gypsum products, building stone, marble, slate, riprap, etc.

row houses with masonry walls. As in the past, however, most will be detached houses of frame construction. The shortage of bricklayers, previously mentioned, will increase the use of frame construction somewhat, as well as bring some use of concrete blocks instead of brick. In line with recent trends, basements are likely to be omitted in a substantial number of cases. While footings must be carried to sound bearing below the frost line in any case, the absence of a basement permits the use of isolated footings and concrete-block piers. With such construction wall framing and floor joists will in some cases be supported by precast reinforced-concrete beams, in those localities where these are available. The volume of this business will be small, but it is significant as an indication of the increasing use for precast concrete products. The over-all effect of these changes, including those cases where a layer of aggregate or a concrete slab is laid on the ground, will be the use of less cement and aggregate than with continuous footings, basement walls and basement floors.

The market for sand and for the various plasters will be reduced by the shortage of plasterers, which in single-family houses especially will tend to cause some replacement of plaster by gypsum board, plywood and the panel boards. The same situation will also cause some increase in the use of gypsum board rather than brown-coat plaster as a base for the finish coat. Other factory-made products intended to replace certain elements of plastering are being placed on the market, especially for the rental housing projects of insurance companies and other large investors. Some degree of acceptance of these seems likely.

An indication of the market which single-family houses have provided in the past for stone, clay and glass products is given in Table IV, showing the physical quantities of these items required for 1,000 such houses. This is part of a table showing all the materials, prepared by the Bureau of Labor Statistics on the basis of houses constructed during the late 1930's. For the reasons already stated, this table is not an exact reflection of expected post-war material requirements; it is, however, significant as indicating the importance of these buildings to the producers in this field.

TABLE IV—ESTIMATED QUANTITIES OF STONE, CLAY, AND GLASS PRODUCTS REQUIRED TO CONSTRUCT 1,000 SINGLE-FAMILY HOUSES

Bricks	3,500 M. Pieces
Concrete blocks	400 M. Pieces
Cement, Portland	23 M. Bbl.
Cement, masonry	15 M. Bags
Sand, torpedo	7 M. Cu. Yd.
Sand, masonry	15 M. Cu. Yd.
Gravel	20 M. Cu. Yd.
Plaster, gypsum	90 M. Bags
Plaster of Paris	15 M. Bags
Lime, hydrated	40 M. Bags
Terra cotta, drain tile	40 M. Lin. Ft.
Terra cotta, sewer tile	30 M. Lin. Ft.
Composition siding	300 M. Sq. Ft.
Lath, sheet	2,800 M. Sq. Ft.
Ceramic tile	60 M. Sq. Ft.
Glass	3 M. Boxes
Slate	1,250 M. Squares

In the residential field alteration and modernization work is expected to be large—very nearly a quarter that of new construction. For the most part, however, this will involve only incidental use of concrete, masonry and plastering materials. Present indications are that work will be concentrated largely on plumbing, heating and electrical installations, and on finishing into usable rooms of unfinished attic space and in some cases unfinished basement space. Some of this will involve new plastering or extensive patching, but in many cases only a little patching will be needed after electric, duct or pipe work has been done within the partitions. Other common types of improvement will be the application of insulation, some of it made from inorganic materials, and the application of new exterior surfaces, commonly consisting of asbestos-cement shingles. The most extensive individual jobs will in general be the conversion of large, old houses into apartments, and the modernization of old-fashioned apartments, frequently with an increase in the number of dwelling units in the building. These jobs will ordinarily involve new partitions and plastering and, in some cases, masonry as well. Additions, in the sense of increases of gross floor area and cubical contents, are expected to make up a rather small part of the work on existing houses.

Commercial Building

In the commercial field work on existing structures is expected to exceed totally new construction by a ratio of about 5 to 3. As with residential modernization first emphasis will probably be placed on the mechanical trades, with special attention in this case to air conditioning, modernization of elevators, and, in some types of buildings, the installation of escalators. While primarily mechanical these improvements will commonly involve other trades to some degree—sometimes suspended ceilings to conceal dust, the shifting of partitions, minor structural changes to support added mechanical equipment, new wall treatment to accompany new plumbing installations or fixtures in toilets of semi-public buildings. New show windows, fronts and entrances and new lobbies will also receive attention. In all these cases stone, clay and glass products will be in competition with other materials, but may be expected to get a fairly good share of this business. Prospects in comparison with past use are probably better for some of the factory-made products, such as structural glass, glass block, precast terrazzo, and the marble-like composition panels used for ornamental surfaces, than for the standard bulk materials. The moving of partitions between rental units in store and office buildings will mean masonry and plastering, as in the past, but for interior partitions in large offices increasing use will probably be made of the numerous types of movable partitions.

New commercial construction is expected to consist more largely of smaller and outlying projects than in the pre-depression period. While metropolitan office buildings, hotels and department stores will be constructed, they will be neither so large nor so numerous as those of the 1920's. There are strong indications of a trend toward larger glass area for the exteriors of office buildings and other major commercial structures, meaning a slight reduction in masonry materials and even in plastering. No important changes in design affecting the use of sand, gravel and stone products are expected for other nonresidential buildings, except for somewhat increased use in institutional buildings of the glazed partition tile which was introduced a few years ago. This provides a finished surface on both sides, and where used will cut down the quantity of plastering and the requirements for plastering materials.

Utility construction will vary in its material requirements. Primarily it is non-building in nature. Railroad work will be the improvement of existing facilities rather than the extension of facilities. While trackage will be constructed to relieve congestion and improve operating conditions, this is likely to be largely offset by the removal of trackage installed solely for war-time requirements. It is thought that almost half of the railroad construction will consist of signal installations, bridges and mechanical facilities, for which in most projects pit and quarry materials are minor. Except for local transit, the situation is in general similar for the other utilities. There will be buildings, underground work,

footings for towers, etc., but the work will be largely the construction of lines and installation of highly fabricated built-in equipment. In the case of local transit the principal items are expected to be very few subway jobs and a few fairly extensive relocations of car tracks in connection with improvement of arterial street systems in metropolitan areas.

Highways In the publicly financed field the largest single item and also the largest market for cement and aggregate will be highways, roads and streets, including related structures such as bridges. On the primary highway system there will be continuation of the shift in emphasis from extension of the hard-surface mileage to increased traffic capacity and greater safety. This means additional lanes, grade separations, and replacement of bottlenecks and danger zones. Particular attention is likely to be given the urban and suburban portions of primary highways. All this work, whatever the surface, will have aggregate as its principal material from the standpoint of bulk. The bridge and grade separations, even when the main span is of steel, will, of course, use concrete for the approach structures and for piers and abutments. Airport work will be very similar to that on highways, consisting mainly of grading and hard-surfacing.

Reclamation, conservation and development work will also use cement and aggregate in quantity. Some of the work will be dredging and building of levees, some breakwaters and revetments, some of it the building of earth dams, some probably the installation of generating and transmission facilities for electric power, and a substantial part will be mass concrete structures.

With a few exceptions materials will come from the established producers and through established channels. In building construction and in urban construction of other types the production of aggregate or other materials by the contractors is entirely impractical, except for those contractors also permanently established in the materials business. Occasionally highway contractors find it advantageous to open a gravel pit, when working on a large job far from a good commercial source, but ordinarily they have found it more satisfactory to buy aggregate and will continue to follow this custom. Not uncommonly state and county departments operate their own pits for producing maintenance aggregate and from these obtain the materials needed for small force-account construction jobs. Increased use of ready-mixed concrete for paving may mean the entrance of a few paving firms into the general ready-mixed-concrete field and of a few ready-mix firms into the paving field, but is unlikely to change the composition of either industry substantially. Reclamation work is likely to be a smaller market for the commercial producers than might be indicated by the quantities of aggregate needed. The mass-concrete projects are ordinarily too far away from plants able to supply their requirements. That fact, combined with the duration of such jobs and the quantities needed, usually makes it worth while for the contractors to set up their own plants. Riprap and concrete materials for breakwaters and revetments, however, will be bought from the materials industry as in the past.

Washington Letter

(*from page* 78)

dations, they must answer some of the most perplexing economic questions in the book. How should labor and management share in the profits of production? How much profit is enough profit? Should wage increases be made contingent upon profits under some sort of profit-sharing plan? If a percentage formula is applied as a ceiling to wages, should profits be similarly restricted? If the fact-finding plan is not enough, it is because the wage issue can not be judged by itself, but only in reference to other costs of production, and to prices and profits. Unless some underlying policy is promulgated to serve as a guide, it is difficult to see on what basis the recommendations of the fact-finding panels would be made. Extensive hearings are planned on the President's proposal and it is possible that some definite answers will result. But until they do, the wages-prices-profits issue will remain the hottest in Washington.

Highway Plans

(*from page* 82)

Successful completion of the work planned for the next 12 months, however, will not be an easy task. There are many obstacles ahead. The machinery of highway construction has been partly disassembled and widely scattered during the war years. State highway departments and contractors need their experienced men back. New trucks, tires, repair parts and road-building equipment are needed. Labor problems may limit the production and delivery of bituminous materials, cement, lumber, reinforcing steel and other necessary supplies. Delays in the production of essential materials will delay the program.

If these obstacles can be overcome, the demand for aggregate and other road-building materials during the present year and the next several years will enable producers of these materials to establish production records never before equalled in the history of highway construction.

Bureaus Devise Method For Co-ordinating Work

An agreement designed to avoid duplication of effort and calling for a continuous exchange of data and information has been reached between the Department of Commerce and the National Housing Agency. Signed by Secretary of Commerce Henry A. Wallace and N.H.A. Administrator John B. Blandford, Jr., the accord covers working relations between the recently established Construction Division in the Department's Bureau of Foreign and Domestic Commerce and the N.H.A.

South Dakota Reports Decrease in Shipments

With government defense projects completed, shipments of cement, crushed rock, sand, and gravel from the Black Hills area of South Dakota decreased last year from the preceding two years, reported State Mine Inspector H. H. Stewart.

Shipments of bentonite, however, totaled 4,130 cars last year, compared with 2,814 in 1943, according to Mr. Stewart, who estimated the value of 1944 bentonite shipments at more than $2,000,000. Next most important mineral from the area was feldspar, with 1,320 carloads. Others included beryl, mica, and lepidolite.

In the Pit and Quarry Handbook and Directory can be found the answer to nearly every question about the nonmetallic minerals industries and the methods and equipment used by them.

New York State Crushed Stone Assn. Discusses Problems of the Industry

another ON THE SPOT report

APPROXIMATELY 75 members and guests gathered at the Hotel New Yorker in New York City on November 30, to attend a meeting and dinner of the New York State Crushed Stone Association. The afternoon meeting commenced at 2:00 P. M. with Chairman Harvey N. Clark, of Dolomite Products Corp., calling the meeting to order. Harry R. Hayes, secretary of the Association, read the minutes of the last meeting. A discussion stressing the extreme importance of dust control followed. December 10 and 17 were suggested as tentative dates for a proposed conference to further discuss this subject.

Transportation facilities to the annual meeting of the National Crushed Stone Assn. to be held in Cincinnati were discussed and Clarence A. Munz, of Eastern Rock Products Inc., was appointed to arrange the details. "The Duties of the Field Engineer" were discussed by J. E. Gray, field engineer of the national association. Mr. Gray stated that through a series of talks, the field engineers are making known the results of their research on crushed stone. Assisting the producer and the customer with problems continually confronting them was another duty of the field engineer discussed by Mr. Gray.

"Problems affecting the Crushed Stone Industry" were discussed by A. T. Goldbeck, engineering director of the national association. The sale of stone was indicated as one of the most important considerations. Mr. Goldbeck pointed out that sales were affected by the changes in design and specifications and that the association is working toward establishment of a standard size.

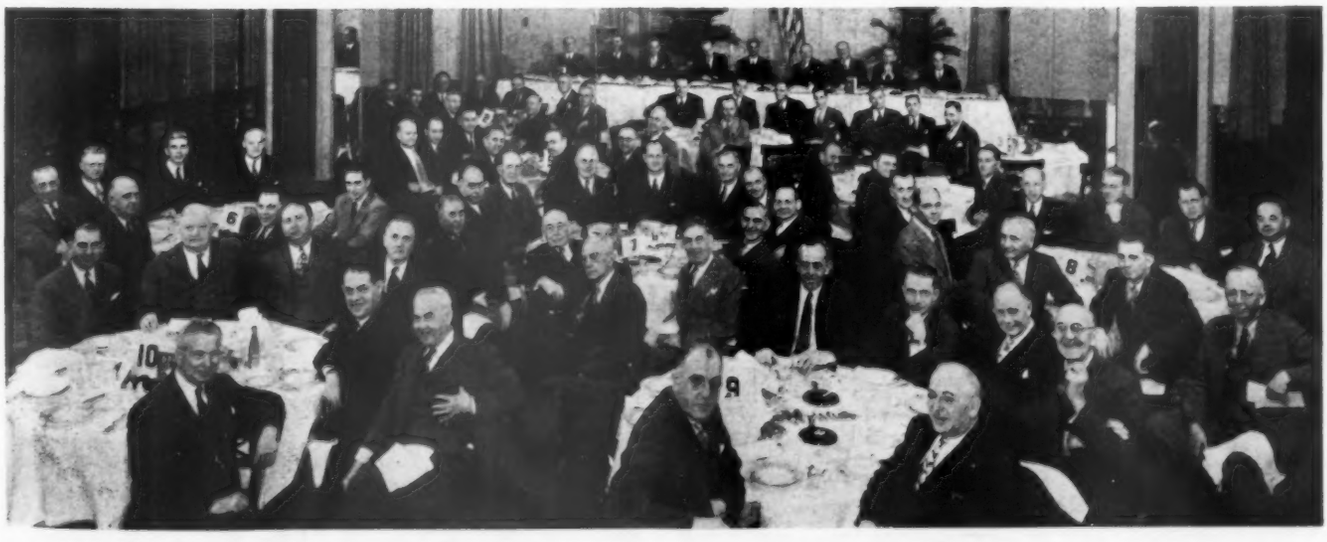
Henry A. Huschke, managing director of the Agricultural Limestone Division of the national association, briefly discussed the future of agricultural limestone. He pointed out that 1944 was the all time high with 23-million tons of agstone produced, and that New York State alone will require twice the amount it required last year. Through promotional matter, Mr. Huschke said, a demand will be created, thereby alleviating the problem of getting the agstone on the farms.

The legislative picture was discussed by J. R. Boyd, administrative director of the national association. The man-power problems are over so far as control is concerned. Order P56 is out, though price ceilings are still in effect and will continue to be. Mr. Boyd predicted that by mid-summer the crushed stone industry should experience unsurpassed prosperity, and he also explained that there is good reason to believe the Gwynne Bill would be passed within two months. These and other facts were gone over by Mr. Boyd, and in closing he advised the group that the annual banquet, which is normally held on a Tuesday night, will be held on Wednesday night. After a discussion on price ceilings, the meeting adjourned for the cocktail party which climaxed the afternoon's activities.

The informal dinner commenced at 7:00 P. M. with Sterling Tomkins, of the New York Trap Rock Corp., as toastmaster. As originally planned, Francis J. Wazeter, member of the Board of Standards and Appeals, was to address the dinner group; however, he was unable to attend the meeting. Substituting for him, Judge H. Myron Lewis, also a member of the Board of Standards and Appeals, assured continued cooperation and assistance.

Charles H. Sells, Superintendent of Public Works, New York State, gave a brief address in which he pointed out that we were too optimistic on the post-war outlook, and until material shortages and labor conditions are somewhat alleviated, the public works program in New York cannot advance. However, he assured the audience that his department will participate in the effort to stabilize conditions.

At the conclusion of Mr. Sells' address, the dinner meeting was brought to a close with the members and guests returning to the cocktail party which had been in progress.



Members of the New York State Crushed Stone Association and guests attend November dinner-meeting held in the Hotel New Yorker.

CANADA CEMENT CARRIES ON PROGRAM OF MODERNIZATION AND IMPROVEMENT

General view of the Canada Cement Company's plant at Exshaw, Alberta, showing slurry silos in foreground.

another P&Q exclusive

THE progress the Canada Cement Company has made in modernizing its various plants was slowed down during the war by the shortage of equipment, materials and labor but never stopped entirely. In an article published in the July, 1945 issue of PIT AND QUARRY was described the construction of new cement-storage silos and packhouses at some of the company's plants and the expansion and improvement of others. Also during the war period the Exshaw, Alberta plant was converted from the dry to the wet process. This was done without delaying production. Now 5 of the company's operating plants use the wet process, the others having been converted during the past 15 years.

The limestone quarry is located in the side of a small mountain and, due to the high sloping face, tunnel blasting is used in place of well-drilling. the rock is loaded by a 50B Bucyrus-Erie shovel into 10-cu. yd. Easton side-dump cars which are hauled to the crusher building by an 8-ton Vulcan gasoline locomotive.

Primary crushing is done by a No. 11 Allis-Chalmers McCully crusher and an SXT99 Pennsylvania hammermill is used for secondary crushing. The limestone is conveyed on a 24-in. belt conveyor to a storage silo 24 ft. in diameter by 50 ft. high.

The shale quarry is located several miles from the mill. A Loomis well drill is used for drilling. The shale is loaded by a No. 21 Marion shovel into an 8-cu.yd. International truck. This dumps the shale into railway cars, the railroad company delivering the shale to the mill, where it goes through a 42- by 48-in. Jeffrey hammermill and is carried by a 24-in. belt conveyor to a silo similar to that used for storing limestone.

Below, left: Close view of the plant with limestone and shale silos at right. Right: The 16-foot air separator in finish-grinding department at the Exshaw plant.

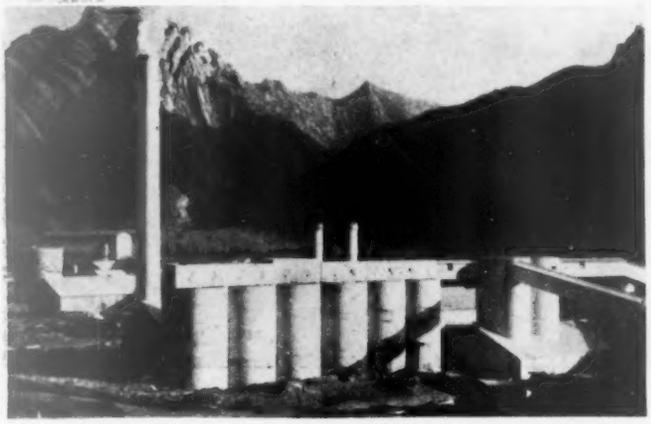
Alberta Operation Now Converted To Wet Process

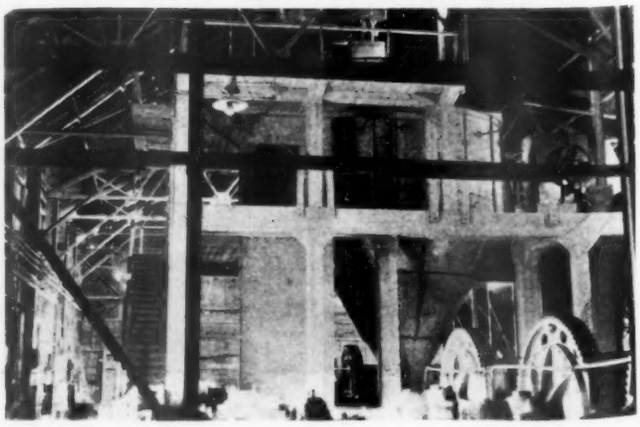
Raw grinding is done by two F. L. Smidth Unidan mills equipped with Symetro drives. The limestone and shale are correctly proportioned by means of Hardinge constant-weight feeders located at each side of the storage silos and discharging to 24-in. inclined belt conveyors feeding the grinding mills.

Slurry is pumped from the grinding mills to blending and storage silos by two 4-in. Wilfley centrifugal pumps. The blending and storage system for slurry consists of six silos 24 ft. in diameter by 49 ft. high. One silo receives the slurry from the grinding mills, two silos are used for blending and mixing, and the correctly-blended and mixed slurry is stored in three silos. Six-inch Wilfley centrifugal pumps are used to transfer slurry from one to another of the first three silos for blending. The same pumps transfer the slurry to the storage silos. Air agitation, consisting of four 1-in. pipes, provide adequate mixing for the slurry. The total storage capacity of the six silos is approximately 14,000 barrels. Two 4-in. Wilfley pumps supply kiln feed.

A bucket-type feeder, synchronized with the kiln speed, feeds the kiln. The feeder was designed by the company's engineering department and provides a uniform volume of slurry to the kiln regardless of the quantity of overflow returning to storage. The slurry feeder is placed over one of the storage silos so that the overflow discharges into the silo below.

The burning is done in a 10- by 276-foot Traylor kiln equipped





Above, left: The new office and laboratory building. Right: One of the raw grinding mills, with special gear reducer in background.

with the Smidth chain system and Unax coolers. A direct-current, variable speed motor drives the kiln, the supporting rollers of which are mounted on Timken tapered roller bearings. A brick-lined concrete dust chamber is provided. Uniform kiln draft is maintained by an induced draft fan and louvre dampers. The brick-lined concrete stack is 150 ft. high. All instruments necessary for efficient kiln operation are mounted on a control panel at the discharge end of the kiln.

The kiln is direct fired with pulverized coal which is ground in two 4- by 9-ft. Kennedy-Van Saun mills. These mills are located near the discharge end of the kiln and are under the observation of the burner at all times.

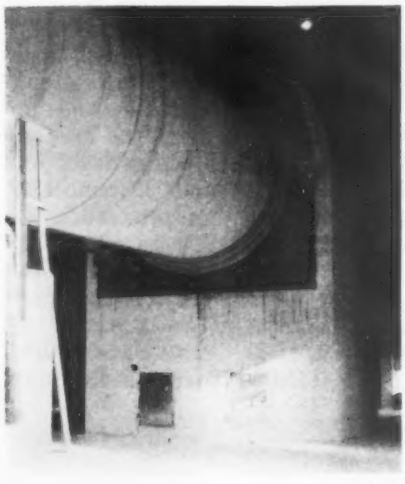
The clinker is cooled in ten 4- by 17-foot Smidth Unax coolers and conveyed to the storage in an 18- by 24-inch McCaslin conveyor. The primary grinding of clinker is done in eight No. 8 Krupp ball mills. Finish grinding is done by five 5- by 22-foot Gates tube mills in closed circuit with a 16-foot Sturtevant air separator.

The cement is pumped to the stockhouses by means of a 6-inch Type H Fuller-Kinyon pump and a C-120 Fuller rotary compressor. High-early-strength cement is stored in a 50-ft.-diameter by 60-ft.-high silo with a capacity of 30,000 barrels. A 6-in. portable Fuller-Kinyon pumping system transfers this cement to the packhouse. Standard portland cement is stored in two rectangular stockhouses having a capacity of 339,000 barrels. The cement is packed by 3-spout Valve Bag packers.

A new concrete-block, stucco-faced office building and laboratory has been built. It is expected that a modern coal-handling plant using silos for storing and blending low- and high-volatile coals will be constructed shortly. Also proposed is a new reinforced-concrete and concrete-block packhouse and bag storage. The demolition of several old buildings housing obsolete dry-process equipment is being carried out at the present time.

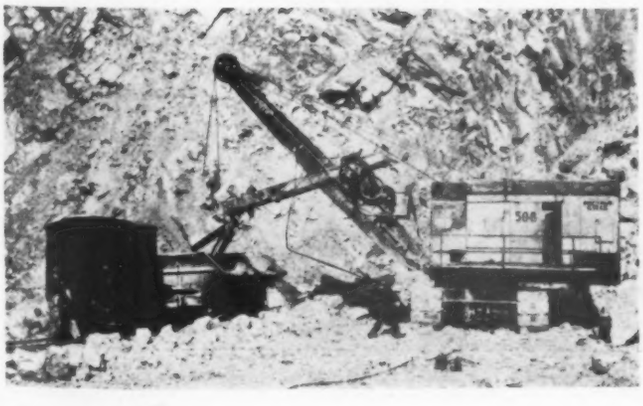
J. B. Hanly is superintendent, K. E. Alexander is assistant superintendent, and D. H. Thomas is chemist of the Exshaw plant.

According to the Mexican Ministry of Communications and Public Works, that country will complete its 1945 road construction and repair program, since adequate funds now are at hand and the needed machinery and equipment is once more available.



Left: Brick-lined concrete dust housing on the 276-foot kiln. Right: Constant-weight feeders proportion limestone and shale for the mill.

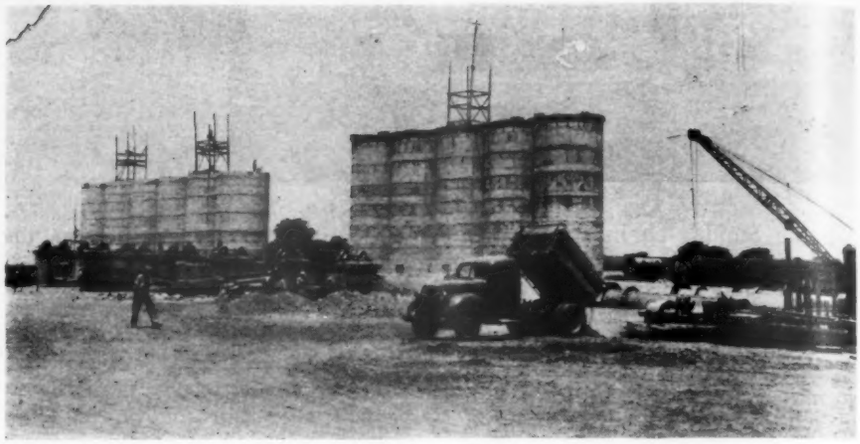
Below, left: Shovel loading cars in limestone quarry. Right: Exterior of crusher building.



Cement Industry Getting Prepared For Post-War Construction Demands

THE portland cement industry in the United States, since the peak of the war construction boom late in 1942, had been existing on the decreasing amount of supplementary work, occasional special war projects, and the moderate amount of highway and other construction permitted during that period. The low point of production was actually reached in July, 1944. With the end of the war in Europe in May, 1945, some of the restrictions on new construction were relaxed and cement consumption quickly responded. V-J Day was the signal for further relaxation of restrictions, leaving the industry with rosy prospects for the future beclouded only by strikes, shortages of equipment, materials and manpower, and considerable uncertainty about many other things.

The industry, of course, began at once to increase its output as much as possible on the certainty that the anticipated post-war construction program might be delayed but not stopped. At the same time producers began to put into action some of their long-deferred expansion and improvement programs, some of which had been hatched during the early 30's when the country was recovering from the depression. Not all these plans have yet been announced but enough of them are known to insure probably the greatest program of this kind in the history of the industry. Probably not nearly as many new plants will be built as in the years just before the depression but this will be outweighed by the vast expenditures for the expansion and improvement of existing plants. Apparently nearly every plant will make some major changes.

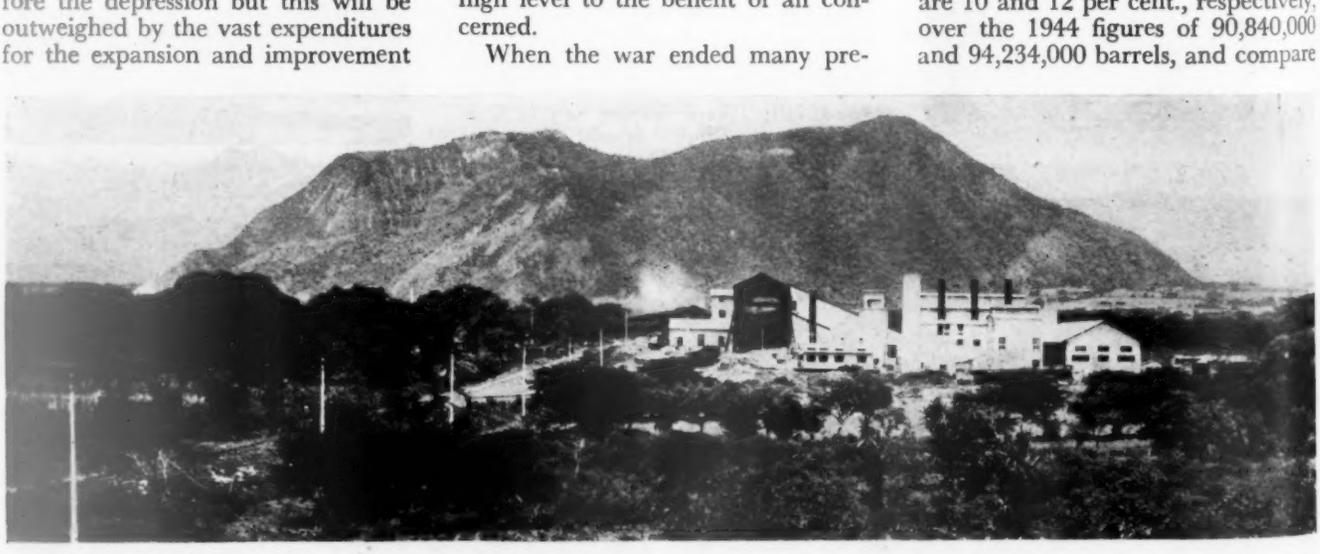


Construction view of the new plant of Cementos Portland del Bajio, S.A., at Leon, Guanajuato, Mexico. Shown are the coolers, silos, kiln foundations and some of grinding mills.

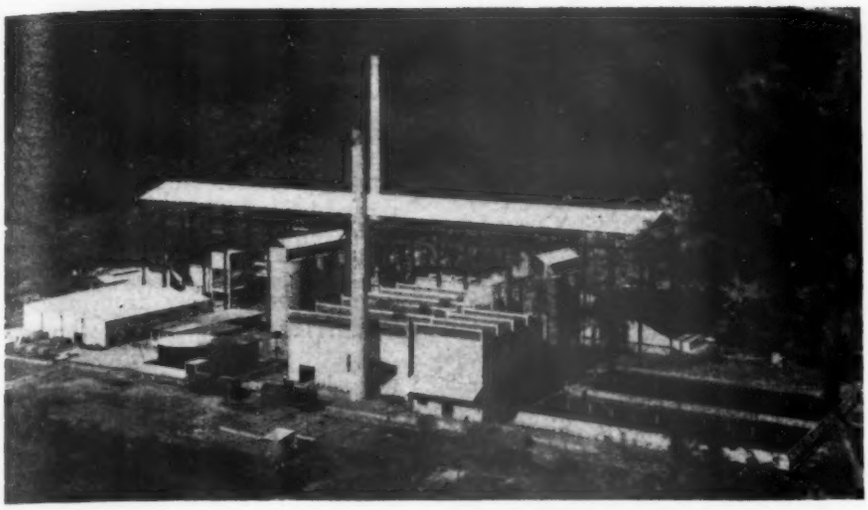
The growing volume of construction work definitely scheduled has reached such proportions that experts are predicting from five to ten or more boom construction years, presumably followed by a sub-normal period. The government has definitely committed itself to a plan of controlled governmental construction which will hold back such work when private construction is at a high level and release it when the volume drops off. If this works out as planned there will be no real boom but instead an unlimited period of construction at a high level to the benefit of all concerned.

When the war ended many predicted that 1946 would be the first big construction year but the slowness of reconversion, labor troubles, shortages of materials, etc., have postponed this to 1947 with volume really beginning to build up in the last half of 1946. It may be fortunate that the same shortages and delays are hampering the cement and construction industries, as well as practically all others, as business in general may then build up gradually with no acute shortages or heavy surpluses.

1945 Production and Shipments The final figures on cement production and shipments in 1945 will not be available for some time but, estimating figures for November and December, it seems evident that production was at least 100,000,000 barrels. Shipments are estimated to be about 106,000,000 barrels. These figures are 10 and 12 per cent., respectively, over the 1944 figures of 90,840,000 and 94,234,000 barrels, and compare



General view of the new plant of Cementos Veracruz, S. A., near Orizaba, Veracruz, Mexico.



General view of the new plant of Cooperativa Manufacturera de Cemento Portland "La Cruz Azul" at Lagunas, Oaxaca, Mexico. Spray cooling ponds are at right.

with the all-time peaks of 182,759,000 and 185,267,000 barrels in 1942 and those of 105,548,000 and 106,533,000 barrels in 1938, which was considered a slightly below average year.

Stocks dropped off during the year and at the end of October were only 12,396,000 barrels, the lowest in many years, probably largely due to contractors and dealers building up stocks. This means that producers must keep going at as high a capacity as possible during the winter in order to build up a stock for the big season ahead. This will get the 1946 season off to as good a start as labor and material shortages will permit.

Future Prospects The prospects for the industry for 1946 are bright, but no one would attempt to estimate what totals of production and shipments will be reached. A guess would be that the volume shoud be considerably over that of 1945 and possibly higher than that of any post-depression year except 1941 and 1942. In 1947 it is possible that a new high level may be reached.

It is well known that public construction is being delayed by the shortage of help and materials. It may be further delayed in order to give the private home-building industry an opportunity to overcome the terrific housing shortage. Other reasons for the delay in public construction are: the unwillingness of contractors to submit bids when they know nothing about future material and labor supplies, costs, etc.; the slowness of states in appropriating necessary funds for such work; the delay in the preparation of the necessary plans for such construction.

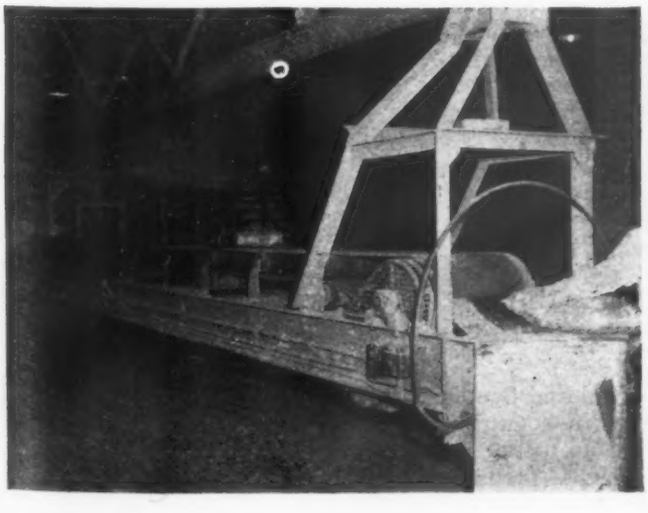
Changes in Production Facilities As in 1944 no new plants were built in the United States during the past year and no important plant expansions were made. No plants were dismantled and none of the few which have been shut down for long periods were brought back into production. Minor improvements were made by only a few plants. There is little doubt that the industry was able to spend less on plant improvements in 1945, due entirely to priority restrictions, than in even the worst depression year.

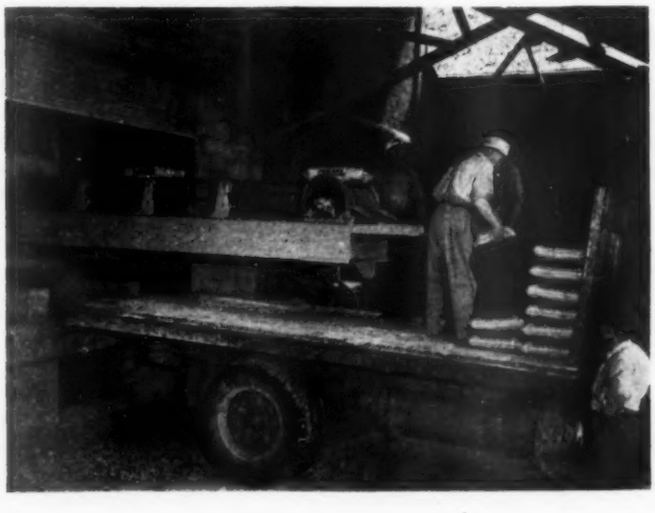
Future Plans The magnitude of the expansion and reconstruction plans of the cement industry became more apparent during 1945 as one company after another released information. The Pennsylvania-Dixie Cement Corp. announced a $3,000,000 remodeling program at its Kingsport and Richard City, Tenn., and Clinchfield, Ga., plants. This program is already under way. The Ideal Cement Co. has under way a $300,000 remodeling program at its Union Portland Cement Co. plant at Devil's Slide, Utah. The Lehigh Portland Cement Co. is working on plans for a plant to produce cement from marl deposits near Monticello, Minn.

The Permanente Cement Co. is reported to be reviving its post-war plans for a storage and distributing system at Pacific Coast points. The necessary boats have been obtained and bids have been received for the construction of an 80,000-bbl. capacity storage and packing plant in Seattle. The company already has a plant for bulk cement shipment at Redwood City, Cal. From this the company supplied most of the cement for U. S. Navy works in the Pacific islands.

The Medusa Portland Cement Co. has announced plans for the construction of a bulk-cement storage and packing plant to supplement those it now operates at several Great Lakes points. The Marquette Cement Mfg. Co. plans to build a

Left: Car-loading end of shuttle conveyor used in Hull, Quebec plant of Canada Cement Co. Right: A similar shuttle conveyor extended at other side of building for truck loading.





100,000-bbl. storage and packing plant in Milwaukee.

As one of the first steps in its extensive post-war modernization and expansion program the Lone Star Cement Corp. is building an addition to the packhouse at its Limedale, Ind., plant.

The Aetna Portland Cement Co., Bay City, Mich., is installing dust collectors, silos, etc., in its remodeling project. The Federal Portland Cement Co., Buffalo, N. Y., plans a $300,000 program of improvement to include new equipment, storage silos, and a laboratory building.

Prices The possibility that cement producers generally will eventually be granted price increases to meet the higher cost of doing business became brighter when, on September 5, the O.P.A. raised price ceilings 10 cents per barrel in Ohio, West Virginia, Michigan, Virginia, Kentucky, and parts of Pennsylvania. On December 11 ceiling prices on all types of portland cement except white were raised 20 cents a barrel in two areas including Nebraska, Kansas, Oklahoma, Arkansas, western Missouri, Idaho, Montana, Wyoming, Utah, Colorado and New Mexico.

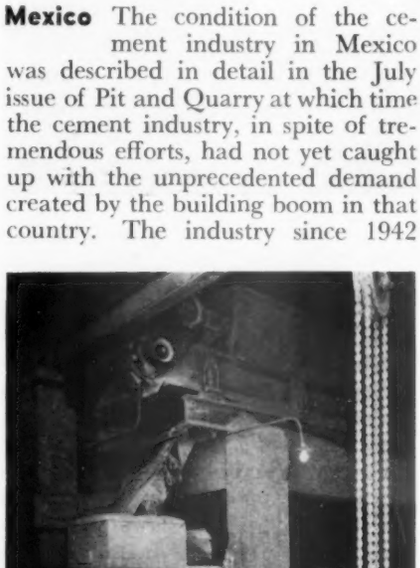
Cement Types Since WPB Limitation Order L-179 was revoked late in 1944 many cement companies have brought out new types of cement—mostly masonry and stucco—or put back into production those made before the limitations became effective in August, 1942. As yet, however, we have not heard that any one plant is producing 16 types of cement or that any one company is producing 21 types, believed to be pre-war records.

Foreign Developments

Canada In Canada the Canada Cement Co., which dominates the industry with six of the nine operating plants and five distributing plants, is continuing its long-range plant improvement and expansion program. The latest steps were the construction of extensive cement-storage and packing facilities at its producing and distributing plants, new office and laboratory buildings at the plants, and the completion of major improvements to the Exshaw, Alberta plant which was converted to the wet process. It is also planned to build at Exshaw a modern coal-handling building, new storage silos and a packhouse. Now under way is a program for expanding the company's facilities for the water shipment of bulk cement to distributing plants and other points over a wide area. The clinker-grinding departments of several plants are also to be improved.

The British Columbia Cement Co., Ltd. is engaged in an extensive remodeling of its Bamberton, B. C., plant which will modernize the plant completely and materially increase its productive capacity. A new kiln and a coal-grinding system are among the items to be added.

Mexico The condition of the cement industry in Mexico was described in detail in the July issue of Pit and Quarry at which time the cement industry, in spite of tremendous efforts, had not yet caught up with the unprecedented demand created by the building boom in that country. The industry since 1942



The cone crusher and vibrating screen following one of the two stone driers in the plant of Cementos Mexicanos at Monterey.

had added three new plants to the eight already in operation and had expanded most of the others, to nearly double the industry's capacity. Since then another plant, that of Cementos Veracruz, has gone into operation and at least five others are in various stages of construction and these, when completed, are expected to bring capacity up to three times the 1942 figure. One of these plants is actually an old one being moved to a new location. Other new plants and expansions are planned.

Meanwhile the country continues to encourage cement imports to supplement domestic production by its suspension of the usual import duty. Most of this cement is coming from the United States but some is also reported to be originating in Canada and England.

South, Central America The Central and South American countries continue to expand their cement production facilities as fast as equipment can be obtained from the United States. As in Mexico most of these countries are experiencing building booms and the demands for cement are far beyond the industry's capacity to produce. New plants are reported being built in Chile, Panama, Peru and other countries.

European Countries Judging from the reports of men who have visited European countries since the cessation of hostilities the cement industry there suffered comparatively little damage. This is probably somewhat of a surprise to many as, early in the war, cement plants in some theaters of operation were major objectives of our bombers. In France the damage is said to be comparatively light, probably affecting only 15 to 20 per cent. of capacity. In Germany the damage seems to have been slightly greater. Conditions in Russia are not known. The latest information available (see Pit and Quarry February, 1938, pp. 61-4) is that in 1938 Russia had 48 plants with a total annual capacity of about 46,000,000 bbl. Additional plants have since been built. Most of these plants are in invaded territory but the extent of the damage to them is not known.

It seems, therefore, that Europe will need only moderate quantities of equipment to bring its cement industry back to prewar capacity. If drastic increases in capacity are made, as seems likely, this means that these countries will compete with U. S. producers for equipment made in this country. It is not yet known whether the reconstruction plans in invaded countries will be held back to the capacities of their cement plants or whether cement importations will be permitted.

At present the entire continent is suffering from a severe coal shortage which will for some time hold down the capacity of the cement industry. This is true even in Spain and Sweden which, although non-combatants and undamaged by the war, depend on war-torn countries for the comparatively high-grade coal needed for cement manufacture.

Dust collection is rapidly becoming one of the most important problems in the nonmetallic minerals industries. See the Pit and Quarry Handbook for complete information.

Pennsylvania Producers Discuss Highway Building and Agstone

A MEETING of the Pennsylvania Stone Producers Association, Inc., and the Agricultural Limestone Division was held December 4, 1945, at the Penn-Harris Hotel, Harrisburg, Pa., with T. C. McDoyle, vice-president of the Association, presiding as chairman. Speakers on the program discussed such topics as: The Use of Agricultural Limestone for Improving and Maintaining Pastures and Meadows; The 1946 AAA Lime Program; The Merits of Bituminous Penetration Base Course for Highway Construction," and the Pennsylvania Department of Highways' Maintenance and Constructions Program for 1946.

Agstone M. C. Gilpin, managing editor of The Pennsylvania Farmer, addressed the group on the subject of the benefits derived from the use of liming materials on the soils of Pennsylvania. He traced the history of its use from the early days when each farmer or group of farmers burned their own lime, and when the quantity applied to the soil was extremely low, up to the present date when more than 1,500,000 tons are used by the Pennsylvania farmers. He demonstrated the benefits derived by using a series of slide pictures which not only illustrated the general improvement of the soils and crops but also the better live-stock and improved farm buildings.

Clyde A. Zehner, state director of the Production and Marketing Administration of the U. S. Department of Agriculture, followed by analyzing the proposed 1946 AAA liming program and stated that 1,000,000 tons of agstone will be applied to cropland, orchards and pastures during 1946 by Pennsylvania farmers. His statistician estimates that 800,000 tons will be ordered by the farmers through the AAA county and community committees. They will also make direct purchases of 200,000 tons from their dealers and manufacturers for which they will make application for cash payments. While the over-all use of agricultural liming materials in Pennsylvania reached the 1,500,000 ton figure, he estimated that the normal annual liming needs of the land require well over 2,500,000 tons.

Mr. Zehner further stated that the Committee has already earmarked $3,500,000 to the state for the 1946 liming program. He explained that 67 cents out of every dollar appropriated by Congress for soil and water conservation will be spent for agstone and will supply one ton for each six acres of land. The speaker made the observation that few people realize the amount of calcium that is being removed from the fields by the sale of crops and other farm products, and stated that studies indicate that it will cost $20 per year to replace the calcium, phosphorus and potash in the milk produced by a single dairy cow and sold off the farm. He went on to say that recent studies made by Dr. William A. Albrecht of the University of Missouri clearly indicate that the application of lime and phosphorus to the soil reaches as deeply into the field of nutrition as it does into the field of fertility, and that, as these elements become deficient, we can expect the index of health to become lower. He also reasoned that as farmers learn to more fully appreciate the value of lime as a conservation material, they will also produce crops containing the health-giving minerals. When Congress passed the Soil Conservation and Domestic Allotment Act, they felt that while the farmer's land is his own, he is holding title to part of our most important national resources and that public money could well be used to preserve and improve this resource, both for the present and future generations.

Mr. McDoyle then introduced Henry A. Huschke, managing director, of the Agricultural Limestone Division, National Crushed Stone Association, who traced the use of lime in the United States in the early 1900's when 500,000 to 600,000 tons of liming material was used and most of it was burnt lime. Last year he said a national all-time high of 23,000,000 tons of liming material was used, and agronomists of the nation estimated that 51,000,000 tons of liming materials would be needed to keep our agriculture in proper form. These needs are not only brought about by the sale and removal of the elements through sale of farm produce, but also by the rainfall which washes the lime out of the soil. He stated that the farmer can expect an average return of $3 for every $1 worth of liming material properly applied to his soil, and that while this return is spread out through a period of from three to five years, it is a profitable investment. The Federal Reserve Banks recognize this and will make long-term loans to the farmer in order to help him with his liming program. Mr. Huschke also explained that his division had developed a program of advertising through blotters, leaflets, etc., which will be supplied to the membership at a nominal cost.

Bituminous Macadam A. W. Mohr, district manager of the American Bitumuls Company and the next speaker on the program, pointed out the following advantages of macadam highway pavements: They are rugged, stable, durable, simple to construct, and can be built rapidly with a relative small amount of equipment; they are of high quality, economical, and are ideal especially for farm-to-market roads. Mr. Mohr advised that this particular type of construction is well adapted to Pennsylvania highway construction because of the wide distribution of high-quality stone throughout the state. Present day macadams are much smoother than those of past years and, of the macadam pavements constructed, he recommends the full bituminous-penetration type as being the most durable, particularly in areas where there is considerable freezing and thawing with its accompanying heaving of the pavement. It was stated that the bitumen holds the mass together firmly and allows it to settle back in place without disintergration, and that the cost of such construction is no more, and often less, than the screenings-bound macadam, but has greater durability than the water-bound or dry-screenings-bound pavement. In closing, Mr. Mohr indicated that, with present improved binders, it is now possible to eliminate all traces of slipperiness and also that macadam construction lends itself well to "stage-type" construction.

Highway Program The chairman then introduced John U. Shroyer, secretary of the Pennsylvania Department of Highways, who advised those present that they would have to move fast if they are to keep pace with his department's activities. Though little publicity has been offered, Mr. Shroyer states that his organization is prepared and ready to launch the biggest road-building program in the history of the state. In a direct appeal to the audience he said, "Men,

(*Continued on Page* 101)

Unique Production Methods Result in New Grade of Whiting

By WILLIAM M. AVERY

another ON THE SPOT report

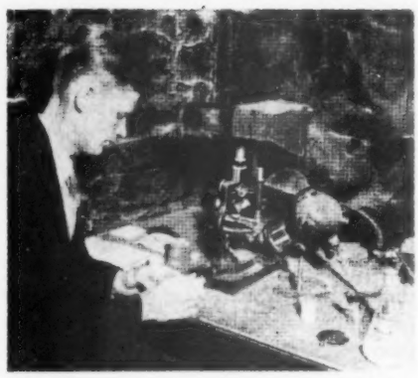
FOR a number of years Harry T. Campbell Sons Company has engaged in the manufacture of commercial whiting at the firm's Texas, Maryland, plant located in Baltimore County a few miles north of Towson, the company's headquarters. The quarry at this site was opened about half a century ago by the late Harry T. Campbell, and for many years the output went primarily into construction and highway work. The exceptionally clear, bright, easily-fractured calcitic limestone in the deposit was uniquely suited for the production of commercial whiting, and as markets for this material grew an increasing share of the output went into its manufacture.

In 1940 James J. Harrison, technical director of the company, after extensive experimental work, succeeded in developing a production technique for manufacturing a new

Picking conveyor, where stone of the proper grade is selected for the production of Camelwite.

grade of commercial whiting of microscopic fineness. Whereas the company's standard commercial whiting is guaranteed to run 95.5 per cent. passing the 325-mesh screen, the new product—which was named Camelwite—is essentially all smaller than 5 *microns*.[1] Fineness of this order is almost impossible to conceive, but a faint glimmering is suggested by the fact that there are about 475,000,000 particles in a single gram.

In June, 1940, a small pilot plant was placed in operation in a room



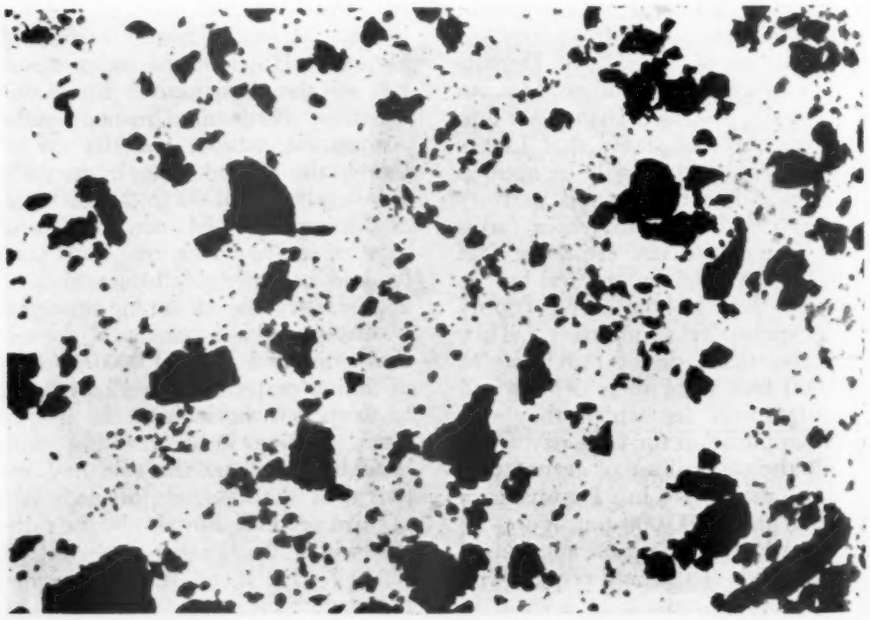
James J. Harrison, Texas, Maryland, technical director of the company, who developed the process for making Camelwite.

of the laboratory building. It consisted of feeding devices, a mill and equipment for classifying, thickening, filtering and drying, and at full blast 600 pounds of Camelwite could be produced in a day. The pilot plant was operated about a year before work was begun on a full-scale plant, in order to gain as much experience as possible with the process, and to eliminate as many "bugs" as possible before undertaking volume production. This cautious attitude has paid off handsomely, for the performance of the commercial plant, which was completed in May, 1942, has tallied almost perfectly with the performance of the pilot plant.

The production of Camelwite actually begins at a picking table, where stone of the proper grade is separated from the general flow of materials into other production units of the Texas plant. The quarry stone is first reduced to minus-12 inches by a McLanahan & Stone 60-inch roll crusher, and trucked to a feed hopper ahead of the picking table. The stone selected for the Camelwite plant is further reduced in a Williams hammermill and elevated to a storage bin from which it is fed continuously and at a definite rate to a double-deck Tyler Hum-mer vibrating screen. The screen is arranged in closed circuit with a roll crusher so that all the material is reduced to minus 16-mesh, and the crusher is operated and controlled to produce the minimum of extreme fines.

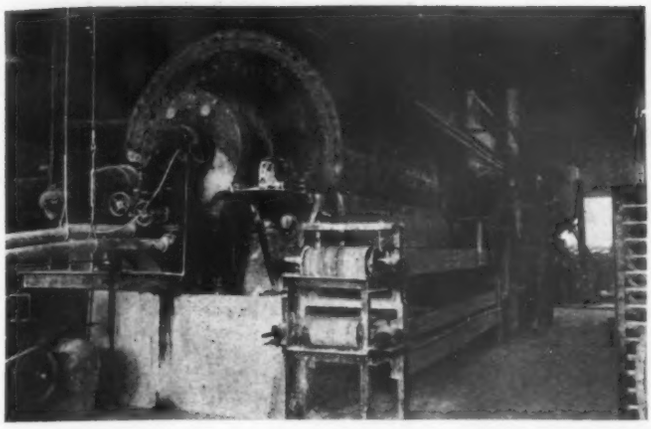
The minus-16-mesh stone is sized and free impurities are removed mechanically before it is fed to a large Patterson tube mill for wet grinding. The mill slurry passes into a dilution tank where water is added to reduce the solids concentration so that efficient hydro-classification can be accomplished by the usual gravity methods.

Further classification of the material is effected by means of a cen-

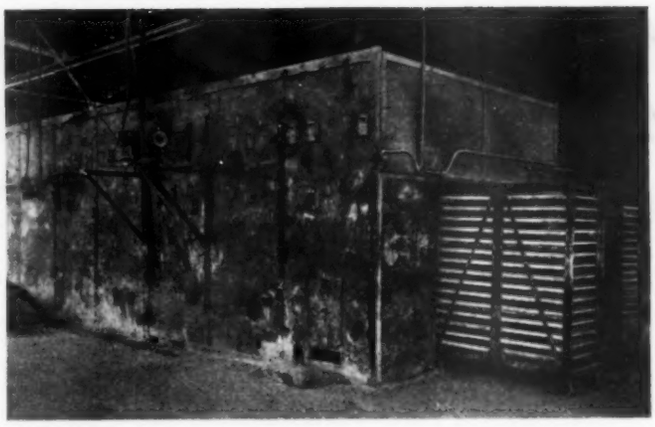


Extreme fineness of the material is suggested by this electron microscope photograph which has enlarged the particles to 7,000 times their actual size.

[1]For the benefit of enthusiasts who enjoy putting things end-to-end to determine how many it would take to go around the equator, a micron is 0.000039 inches.—*Ed.*



A drum-type vacuum filter produces filter cake containing 75 per cent. solids on a wet-weight basis.



The filter cake is dried in shallow pans in a semi-continuous tunnel-truck dryer.

trifuge which is operated and controlled to produce the desired particle size. The classified slurry is thickened to approximately 50 per cent. solids in a Dorr 45-foot diameter thickener, and then filtered by means of an Oliver drum-type vacuum filter. Moisture determination tests are made continuously on the filter cake to insure reduction to a point at which drying may be accomplished most efficiently.

The filter cake, containing 75 per cent. solids on a wet-weight basis, is loaded automatically into shallow trays, which are stacked in suitable trucks and passed through a National Drying Machine semi-continuous tunnel-truck dryer. After the drying cycle, the material is easily disintegrated and pulverized to the same particle size that existed in the slurry. One of the remarkable characteristics of the process is that d i s p e r s i o n is accomplished wholly without recourse to flocculating or dispersing agents of any kind. By limiting the manufacturing process to purely mechanical means, Camelwite is kept free of soluble salts, and cementing action in the drying cycle is avoided altogether, with the result that pulverizing the material back to the original particle size is no problem at all.

Rigid and constant laboratory control is maintained at all stages in the production of Camelwite. Solids concentrations are checked at various points throughout the plant to make sure that maximum efficiency is maintained in grinding and classifying. In addition to regular microscopic examinations to check particle size in production, the finished product is carefully checked in the laboratory for color, brightness and oil absorption, and complete particle-size determinations are made regularly.

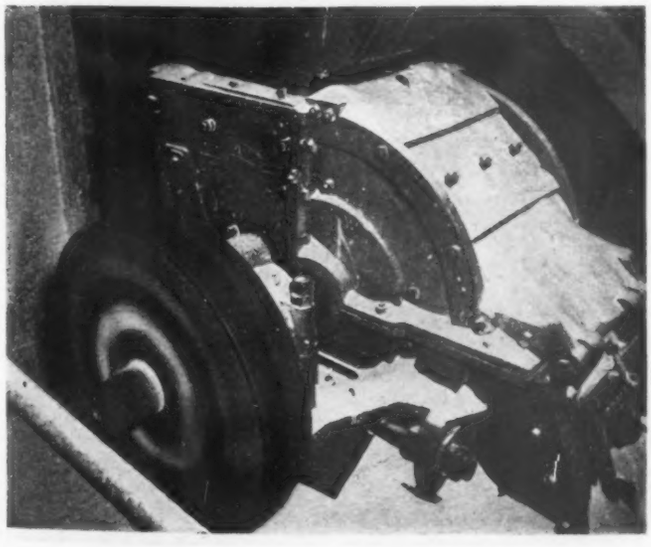
Packed in 50-pound paper bags, Camelwite is at present being shipped to points as far west as the Mississippi River. The extreme fineness of the material has resulted in the development of altogether new markets. Until recently the output of Camelwite—about 40 tons per 24-hour day—had been shipped largely to factories engaged in war production, and as a consequence many of the most intriguing possibilities of the material are still to be explored. It has been used with excellent results in the compounding of synthetic rubber and in the formulation of paints. When it is used as a replacement for precipitated carbonate in flat wall paints and wall enamels, a more satin-like finish is achieved than it has heretofore been possible to obtain.

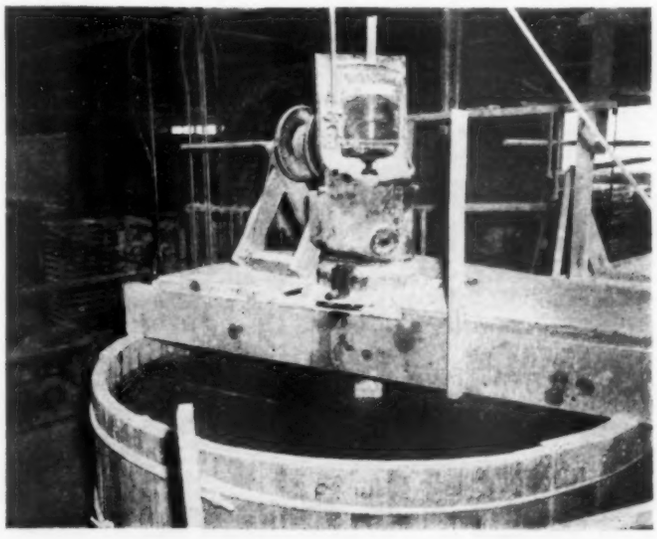
The most recent, and one of the most promising, sales development has been in the coating of paper. The adhesive requirements of Camelwite are said to be much lower than ordinary calcium carbonates, the material comparing favorably in this respect with ordinary clays. In addition it has excellent ink affinity, low abrasive value and has good color value at a brightness of 95 per cent. on the G. E. brightness tester.

In his laboratory Mr. Harrison is carrying on a constant research and

(*Continued on page* 99)

Below: the selected stone goes from the picking table to a conventional hammer-mill. Right: the mill slurry passes into a dilution tank, where water is added to reduce the solids concentration.





CONTINUOUS MATERIAL FLOW ACHIEVED IN ALLIS-CHALMERS LABORATORY

Many Commercial Processes Will Be Employed in the Treatment of Small Samples of Ore at New Pilot Mill

The accompanying illustrations provide a further insight of some of the types of equipment installed in the newly-built research laboratory of the Allis-Chalmers Company in Milwaukee, Wisconsin. In this basic industries laboratory, samples of ores and non-metallic minerals will be processed in quantities up to carload lots. Smaller samples are tested in the five-floor batch testing section, where portions up to 50 or 100 pounds are treated in small batches in laboratory bench size treating machines.

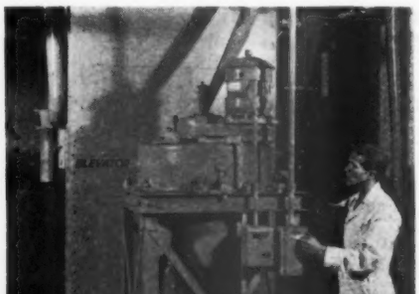
On completion of the pilot mill, it will be possible to treat small samples of ores and minerals by practically all of the known commercial processes, and to furnish valuable information which could not be obtained from small-scale batch tests alone. The pilot mill tests should be invaluable in preventing costly errors of process or design in commercial installations.

This is to augment the original story which appeared in PIT AND QUARRY, November 1945, as lack of space prohibited the use of these photos at that time.

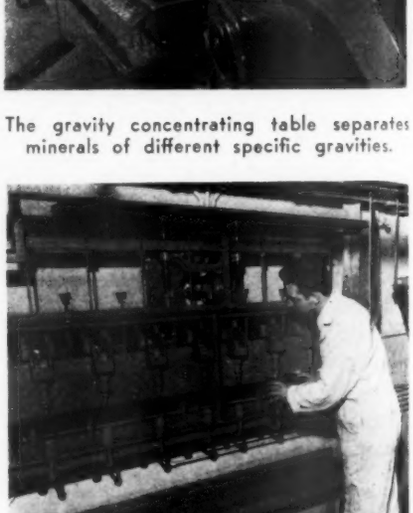
The spiral rake classifier, 48 to 200 mesh range, operates in closed circuit with wet grinding mills.

The gravity concentrating table separates minerals of different specific gravities.

In the sink-float test assembly, a suspension of finely ground heavy media in water floats light minerals and sinks the heavy ones. Media is cleaned by magnetic separation or flotation. Any type of media, including ferro-silicon (85% Fe), magnetite, or galena may be used.

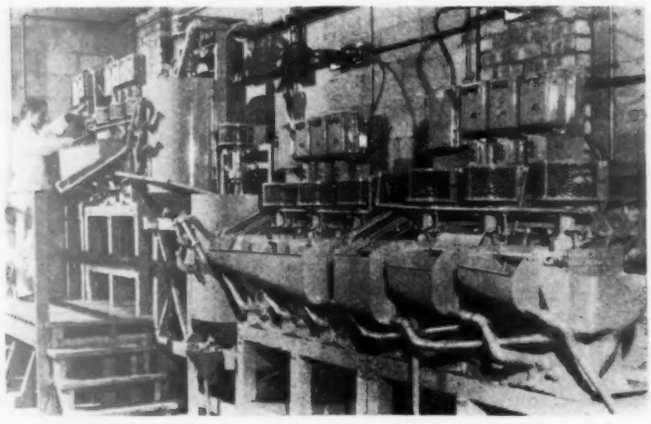


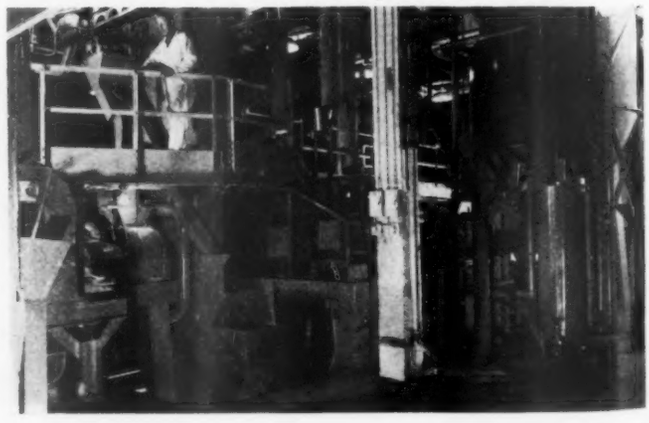
The air separator may receive ore from a 40-foot bucket elevator, and can handle 500 pounds per hour. Separating range extends from 65 to 325 mesh.



Eight-compartment flotation reagent feeder.

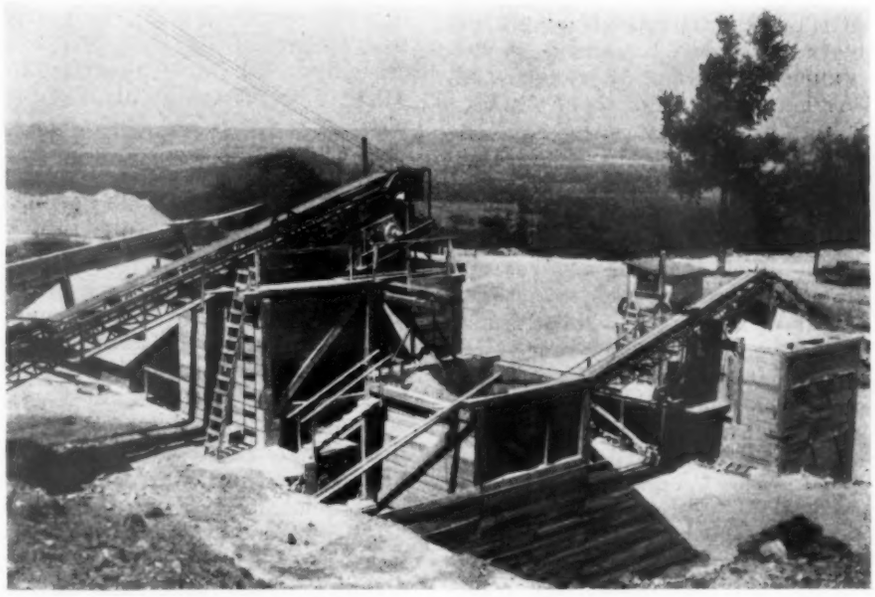
Left: The two-mineral flotation circuit for differential flotation in the kiln room receives wet mixtures from either grinding mill or thickening tank. Right: Elevator and chutes leading from crushers to 10-ton hoppers three floors above.





Aggregates Industries Will Have Share in Post-War Building Boom

THE big news in the aggregate industries — sand and gravel, crushed stone, slag, and light-weight aggregates—is, of course, the tremendous amount of materials they will all have to produce in 1946 and the following years to meet construction and industrial demands. Anyone's guess is good as to the volume of this demand but several years of production at a high level seem assured. The F. W. Dodge Corp. has gone on record that the increase in construction in the 37 states east of the Rocky Mountains will be about 50 per cent. over 1945 in dollar volume. The F. W. A. recently estimated a total construction volume of about $6,500,000,000 in 1946 and increasing amounts in succeeding years to a peak of about $15,500,000,000 in 1959. Other articles in this issue give additional information on this usbject.



General view of the Durand, Wis., plant of the Neuheisel Lime Works. Screen, main conveyor and pulverizer building are at left.

1945 The information available on the total 1945 commercial production of sand and gravel, crushed stone, slag, and light-weight aggregates is so meager as to make impossible even a fairly accurate guess. Judging from the volume of construction and cement production in 1944, however, it seems safe to venture that there was little change, probably a slight increase over 1944. Cement shipments during the year ran slightly ahead of 1944 and were up at least 12 per cent. for the year. How much of this went into building up inventories, however, is not known. The actual construction volume is not known but, according to the F. W. Dodge Corp., in the first ten months of 1945 the total of contracts awarded was about 50 per cent. over the same period in 1944. Shortage of labor, materials, etc., probably delayed the starting or completion of much of this work. The sharp increase in contracts in recent months, however, should get 1946 off to a good start.

Sand and Gravel

1945 The production of sand and gravel in 1945 was probably about the same as in 1944 as this industry is largely dependent on construction for its volume. The stabilizing influence was probably silica sand which continued in high demand throughout the year.

1944 Final U. S. Bureau of Mines figures for 1944 put the total production of sand and gravel at 194,783,000 tons, compared with 234,964,000 tons in 1943. This was slightly over most estimates made at this time last year. Of this total about 77 per cent. came from commercial plants.

Plants Largely because of the low priorities held by producers since the end of the war construction boom there were few new commercial sand and gravel plants built in 1944 and 1945 and few important improvement programs were carried out. With the closing of the war and the relaxation of restrictions, however, producers all over the country began to go ahead with long-deferred plans. A number of important pro-

Left: A general view of Shiely-Petters plant with primary crusher and incline, right, secondary crushing building, center, and final screening building, left. Right: The rail-mounted 4 cu.-yd. electric shovel, with long boom and dipper stick which enable it to reach top of waste rock pile, loading trucks.

grams and a multitude of smaller ones have been announced in recent months.

Pacific Coast Aggregates, Inc., San Francisco, reports a major expansion program to cost about $2,500,000. A new plant is to be built at Eliot, Cal., and five others are to be announced. Other plants are to be enlarged. Expansion of the company's distributing system and warehouses will cost about $1,000,000.

The Kern Rock Co. already has well under way a new 400-t.p.h. plant at Bakersfield, Cal. This will replace an old plant of half the capacity which the company has operated for many years.

The Warner Co., Philadelphia, has announced a long-range improvement program which will include the purchase of a 660-hp. diesel-electric locomotive, ten 1,000-ton steel barges, new crushers, screens, etc.

Crushed Stone

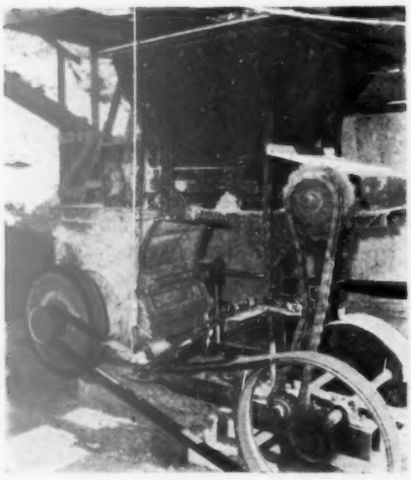
1945 In 1945 the crushed stone industry again was probably not seriously affected by the low level of construction volume because a large part of its output went to industries either unaffected by the war or experiencing a boom because of it. This was particularly true of agricultural limestone, the demand for which still exceeded the capacity of the industry to produce. Only the lack of new equipment or even good used equipment has kept the production of this material from skyrocketing. According to some authorities much of this equipment shortage was caused by the exportation of much good used equipment.

1944 Final U. S. Bureau of Mines figures for 1944 show that a total of 154,960,960 tons of crushed and broken stone was produced. This was a decrease of 9 per cent. from 1943 but was considerably higher than most estimates made at this time last year. Fluxing stone and refractories, railroad ballast and similar uses about held their own and agstone volume was up, but all construction uses were down.

Plants The largest new crushed stone plant of the year is that of Drummond Dolomite, Inc., on Drummond Island, near Detour, Mich. This company dismantled its plant at Sturgeon Bay, Wisc., moved most of the equipment to the new location, and added sufficient new and used equipment to give the new plant an annual capacity of 1,500,000 tons, slightly more than that of the old plant. This plant is expected to be in operation by the beginning of the 1946 navigation season. Power for these operations will be supplied by a 1,875-kw. steam plant.

Another outstanding plant was that of the Shiely-Petters Crushed Stone Co. at St. Cloud, Minn., which went into operation in June. It was completely described in the October, 1945 issue of PIT AND QUARRY. This plant was built to supply railroad ballast for the Northern Pacific Ry. and has a daily capacity of 1,000 tons of ballast plus about 450 tons of finer material which is sold locally as aggregate. This plant is owned by the railway but is operated by Shiely-Petters.

No quarrying is necessary at this operation as it is using waste granite from local dimension-stone quarries. This granite is in pieces up to 4 cu. yd. in size which are piled up to a 70-ft. height. Several earlier attempts to salvage this stone were unsuccessful because they were not on a large enough scale to handle this material economically. Shiely-Petters is loading from these piles with a Bucyrus 175B rail-mounted electric shovel which has a 4-cu. yd. dipper, a 65-ft. boom, and a 48-ft. dipper stick, making it possible to reach the top of the highest pile. The 42-in. Allis-Chalmers gyratory primary crusher is also able to take all but the very largest pieces.



Left: Pulverizer in Neuheisel plant with sliding bin gate and reciprocating plate feeder.
Below: This 2-cage, 36-inch disintegrator in McCorkle plant produces 30 tons per hour of agstone from minus ¾-inch stone.
Right: The double-impeller impact crusher in McCorkle plant discharges into a bucket elevator. Feed hopper is at left.

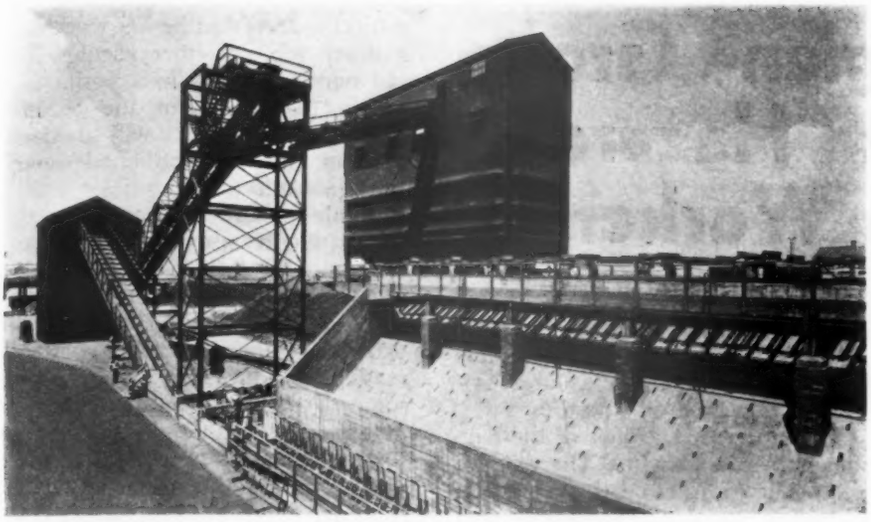
Agricultural Limestone

1945 No figures are available on the amount of agstone produced in 1945 but it is doubtful if it greatly exceeded the 1944 record volume chiefly because of labor shortages. The decrease in crushed stone production was also partly responsible by holding down the "incidental" production of agstone.

Plants In spite of equipment shortages many new agstone plants were built in 1945. Many crushed stone producers also added equipment for its production. Considerable capacity was also added by the conversion to agstone production of the portable crushed stone plants which had contributed so largely to the construction of important war projects. One of the leaders in this was the Concrete Materials & Construction Co. of Waterloo, Iowa. An article in the September, 1945 issue of PIT AND QUARRY described this company's operations which have produced about 1,000,00 tons of agstone annually, about 65 per cent. of it from portable plants.

Another large producer is Norbert Neuheisel of Eau Claire, Wisc., whose three plants were described in the November, 1945 issue. One plant was rebuilt and enlarged in 1944, another in 1945, and the third is now in process. These plants produced over 300,000 tons of agstone in 1945, plus large quantities of crushed stone, and even greater output is expected in 1946. Two of these plants are permanent.

One of the many crushed stone



General view of the slag plant for the manufacture of lightweight Celocrete aggregate at the Republic Steel Corporation plant, South Chicago, Illinois.

plants which have gone into the manufacture of agstone is the McCorkle Stone Co., Milroy, Ind., whose operations were described in the December, 1945 issue. This plant uses hammermills both for primary crushing and for agstone production.

The belief of the industry in its permanence and importance was evident in the formation early in 1945 of the National Agricultural Limestone Assn., an independent association of agstone producers. This was followed in April by the formation of the Agricultural Limestone Division of the National Crushed Stone Ass'n. Both have built up an impressive list of members.

Slag

The production of blast furnace slag in 1944 totaled 12,405,992 short tons in 1944, 25 per cent. less than the 1943 volume. The loss would have been even greater due to the drop in construction volume except for an increased demand for its use in the manufacture of mineral wool, light-weight aggregates, and in agriculture.

Along with other aggregates a slight further drop probably occurred in 1945. The future prospects are very good as this industry is almost entirely dependent on construction for its volume sales.

Lightweight Aggregates

The production of light-weight aggregates apparently again showed an increase in 1945 as several new plants added to the capacity of the industry. No figures are available on the total production of this material but the production of lightweight slag was more than doubled in 1944. One of these new plants, operated by the Republic Steel Corp. at South Chicago, Ind., is producing 350 tons of Celocrete expanded slag aggregate daily. This plant was completely described in the August, 1945 issue of PIT AND QUARRY, and brings to five the number of plants now producing Celocrete. The Celotex Corp. announces that additional plants are to be built at strategic locations throughout the country as part of an expansion program which also affects other Celotex products.

Unique Production

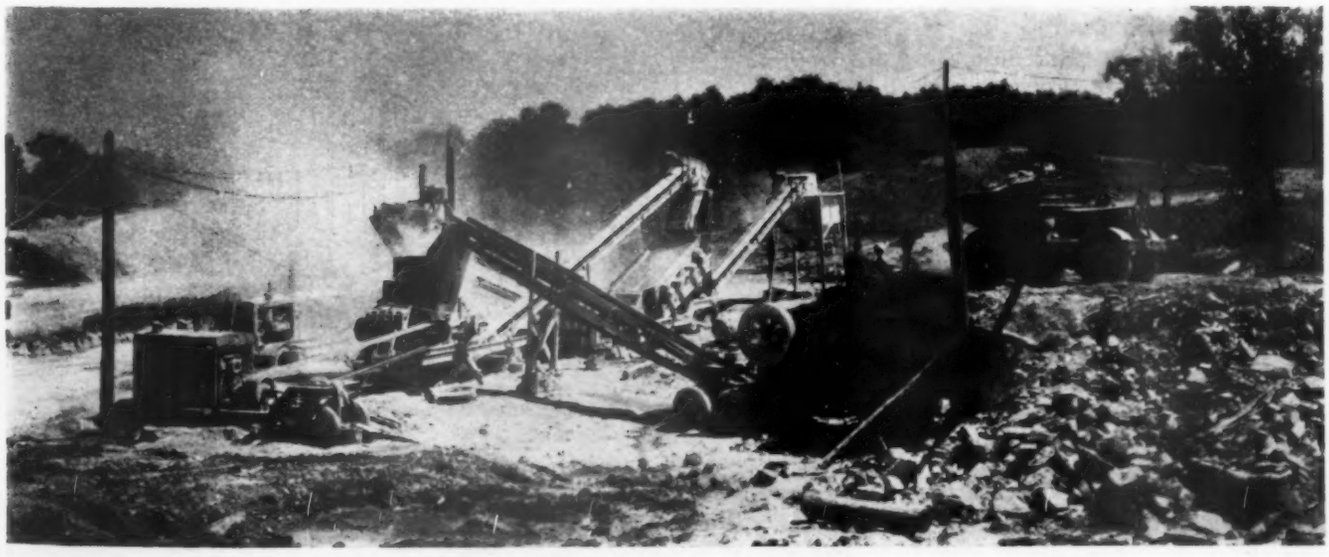
(from page 95)

development program to find new applications and uses for Camelwite, as well as to improve the quality of the product.

The Camelwite plant at Texas is a wholly new development, and is housed in a separate building apart from the facilities which are used in the production of commercial whiting, agricultural limestone, limestone flour, miscellaneous aggregates and chicken grits. Also located on the property is a plant for producing Camelite, the company's trade name for a bituminous-concrete surfacing material.

Bruce S. Campbell is president of the firm and his brother, Harry Guy Campbell, is treasurer.

Are you contemplating the production of ready-mixed concrete — concrete blocks — concrete pipe? Separate chapters on each in the Pit and Quarry Handbook give you the latest and most complete information on them.



General view of a typical Concrete Materials & Construction Company plant setup. The arrangement of the various units can be varied to suit the topography of the site.

Industrial Hygiene Group Studies Health Hazards Of American Workers

APPROXIMATELY 450 persons attended the Tenth Annual Meeting of Industrial Hygiene Foundation and heard speakers declare that industry regards the employment of the returning veteran, not as a duty but as an opportunity — an opportunity to use the veteran's fitness, training and eagerness to participate in production.

A highlight of the two-day meeting, held at Mellon Institute, Pittsburgh, the Foundation's headquarters, on November 14 and 15, was the Navy's presentation of its newly created Certificate of Achievement to the Foundation. (See picture.)

General Lewis B. Hershey, Director, Selective Service System, in delivering the keynote address, asserted, "this manpower that is coming back is a definite asset; you need him more than he needs you. He was a choice of those who went. He lived because he knew enough to meet the varying conditions of life in which he found himself, and survived. He didn't lose two or three years; he learned many things".

Commenting in a similar vein, Dr. H. A. Vonachen, Medical Director of Caterpillar Tractor Company, pointed out that the placement of the veteran at proper jobs "is not a charitable program; so far as industry is concerned it is good business."

Phases of Program Dealing With Dust

Exposure to industrial dust continues to be a major problem in industrial hygiene in spite of the great wealth of material which has been published on that subject. One vexing phase of the problem has been the not infrequent situation where the effects of dust on man do not correlate with the dust exposure. Workmen are found with X-ray evidence of silicosis where there is no free silica in the dust. Or in other cases, workmen exhibit no demonstrable effects after years of exposure to an atmosphere considered to be dangerous.

Five papers were presented at the Tenth Annual Meeting of Industrial Hygiene Foundation which clarify some phases of this anomolous situation. Four of the presentations dealt with "Accurate Diagnosis of Silicosis—Possible Sources of Error". The fifth gave consideration to some newer techniques in the accurate appraisal of silica dust exposures.

Dr. Leroy U. Gardner of the Saranac Laboratory said, "The diagnosis of silicosis rests on three bases, a history of adequate exposure to free silica dust, the demonstration of a characteristic nodular pattern in an X-ray film of the chest and a physical examination which reveals very few abnormal signs in most uncomplicated cases. One's objective may make him forget that not one, but all three of these factors are essential to the diagnosis. From the lawyer or the physician representing a claimant for compensation we hear that the plaintiff must have silicosis because all of his industrial life has been spent in an industry whose atmosphere contains so many million particles of free silica dust. Yet a glance at the claimant's X-ray films may show nothing to support the contention. From the roentgenologist or the internist of an urban medical center comes the diagnosis of silicosis because the film reveals a generalized nodular pattern and the subject reports that he has worked at a dusty job. Neither roentgenologist nor internist is in a position to obtain the details of the occupational history that will indicate whether the dust contained significant quantities of free silica.

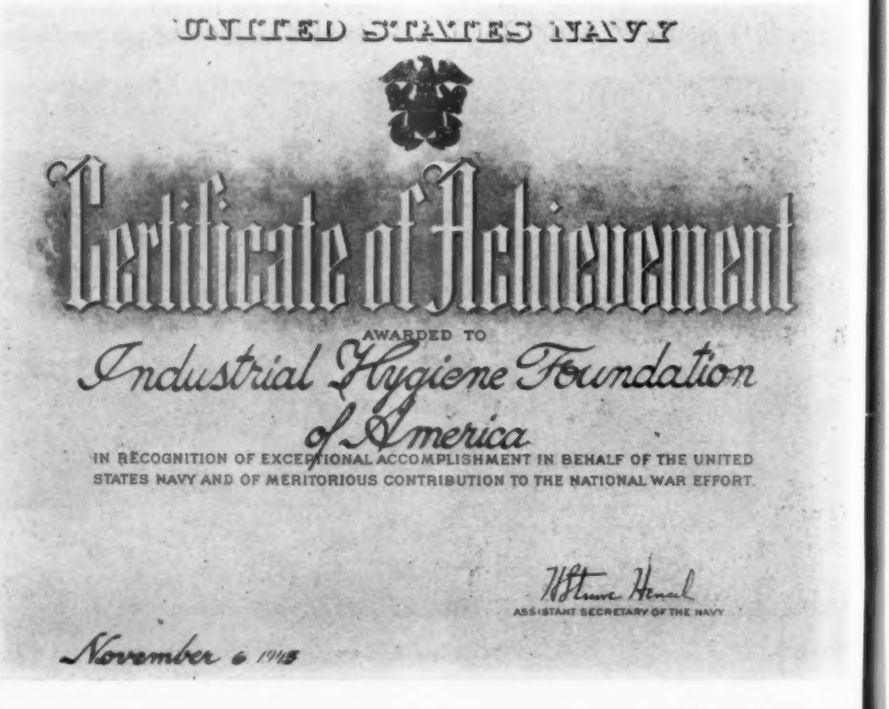
"Unless there is proof that the subject has been exposed to free silica dust for periods measured in years we have no right to assume that a nodular X-ray pattern is indicative of silicosis. Such patterns may be produced by other causes; some of them the result of inhaled materials other than free silica, some to infections or systematic diseases which should be disclosed by a thorough physical examination.

"Among these conditions is the so-called "arc welders' siderosis". All substances of high atomic weight are opaque to X-ray and in sufficient local concentration they cast shadows on a film. Examples of such substances are the compounds of barium and the rare earth minerals. On the other hand, organic iron from the blood may at times cast nodular shadows which simulate silicosis.

"Perhaps even a more striking example of the effect of the blood is seen in the films of men who have been trapped underground in mine explosions. In them the films demonstrate the sudden appearance of fine nodulation but this disappears again after a month or so.

"Another disease is now being recognized which superficially resembles nodulation of silicosis. This is "pulmonary sarcoidosis," apparently a tubercle-like infection of unknown cause.

U. S. Navy Achievement Award Won by the Industrial Hygiene Foundation


UNITED STATES NAVY
Certificate of Achievement
AWARDED TO
Industrial Hygiene Foundation of America
IN RECOGNITION OF EXCEPTIONAL ACCOMPLISHMENT IN BEHALF OF THE UNITED STATES NAVY AND OF MERITORIOUS CONTRIBUTION TO THE NATIONAL WAR EFFORT.
ASSISTANT SECRETARY OF THE NAVY
November 6 1945

"The knowledge that such conditions exist should make us more cautious in diagnosing silicosis, particularly in cases from industries where environmental conditions are unfamiliar or not clearly defined. More progress would be made if roentgenologists would merely report a shadow pattern as nodulation with the qualification that this could be interpreted as silicotic in origin if supported by a history of adequate exposure to free silica."

Other Cases Reported

Dr. L. E. Hamlin, Medical Director, American Brake Shoe Company, described chest X-ray findings among grinders and burners in their foundries which resembled silicosis. However, the silica dust exposure was not sufficient to account for the chest X-ray results. The particulate matter consisted principally of iron oxide fume and it seems possible that the X-ray nodulation is similar to the siderosis of arc welders.

Dr. O. A. Sander, Member, Foundation's Medical Committee, then described several cases of arc welders' siderosis. Post mortem study of the lungs of one welder, whose chest X-ray picture was similar to that of silicosis, showed no fibrosis. This finding is also confirmed by a recent British report on a man exposed to iron oxide in silver polishing.

Dr. A. G. Cranch, Union Carbide and Carbon Corporation, concluded the panel discussion by describing four types of cases where the X-ray findings simulate silicosis but where little or no silica was present in the working exposure, certainly an insufficient amount to cause the lung disease.

Dr. F. R. Holden and E. C. Hyatt of the Foundation's staff described some newer techniques for appraising silica dust exposure. They reported: "For several years it has been our practice to employ the electrostatic precipitator for the collection of samples of dust for composition analysis, collecting them from the breathing zone of workmen. The analysis of these samples, however, consistently showed the presence of dust particles as large as 50 microns or even larger. Analysis for free silica is always reported on a percent by weight basis. Therefore, the presence of one 50-micron particle would have as much affect on the analysis as would 1000 five-micron particles.

"It was, therefore, logical to modify our techniques to include separation of the air-borne dust samples into two size fractions. We chose to separate the dust into portions at the five-micron level. The five-micron and less dust is designated as respirable dust, that portion small enough to be breathed into the lungs, and its analysis provides the data for appraisal of the silica dust exposure.

"The satisfactory application of size separation required quantities of air-borne dust amounting to several hundred milligrams. In some instances it was necessary to operate the electrostatic precipitator during several work days to accomplish this result. This was impractical. Accordingly, we developed a composition dust sampler which employs salicylic acid as the filtering media.

"Air from the breathing zone of workmen is drawn through the filter employing a small blower. We have converted our electrostatic precipitator so that it can be used as a source of suction. The modified electrostatic precipitator will draw approximately 20 cubic feet of air per minute. The electrostatic precipitator with the I-H-F filter will, therefore, collect as much dust in one hour as the precipitator alone will collect in one day.

"Suppose a stone wall to be composed of 900 pounds of quartz rock bound together with a weak lime mortar weighing 100 pounds. This wall would consist of 90 percent free silica as quartz. Suppose that a workman starts demolishing the wall with a sledge hammer. The dust he will raise will obviously be overwhelmingly mortar dust containing little free silica, a result that bears no relation to the composition of the original mixture.

"The Foundation's studies also show conclusively that the conclusions reached by the U. S. Public Health Service on maximum allowable dust exposure apply with equal force if the composition of the free silica in the air-borne dust is based on the 5-micron and less fraction of the dust."

W. C. L. Hemeon, a Foundation engineer, discussed "Findings from Foundation Plant Surveys". He reported: "Control of dust continues to be our most frequent plant problem. The extent of our activity can perhaps best be pictured in these figures. Mr. Hyatt and Dr. Holden performed more than 1,000 dust counts in the past 12 months—which means, by the way, 10,000 individual microscope field counts. In addition they have obtained about 130 atmospheric composition dust samples and processed them for size separation in alcohol for analysis by X-ray diffraction. This work has been distributed among potteries, glass plants, foundries, refractories and several other industries.

"Several hundred additional analyses were made for lead, mercury, selenium, arsenic, cadmium, antimony and miscellaneous gases and vapors in a number of different industries such as steel, rubber, chemical, butadiene, chlorine and machinery manufacture."

Pennsylvania Producers

(from page 93)

next year we are going to use more of your product than in any year in quite some years as we have a stabilization program where we are going to try, if we can get the men, to take care of 1,000 miles of dirt road to be stabilized to a depth of from four to six inches." Explaining that funds are available for a $100,000,000 schedule in 1946, he went on to say that investigation of the state's revenues, using 1941 as a criterion, indicate that a possible $520,000,000 will be available over a five-year period. Mr. Shroyer went on to express his anticipation of full coöperation and harmony between his department and those involved in making the Pennsylvania highway program a reality.

The final speaker of the day was John L. Herber, chief engineer of the Pennsylvania Department of Highways, who amplified the statements of Mr. Shroyer with regard to the extent of the road building program of that state and the necessity for coordination of producers, contractors, and the many other agencies which participate in these programs.

Circular Describes Use Of Agstone in Illinois

A circular authorized by Governor Dwight H. Green of Illinois and published by the Department of Registration and Education, State Geological Survey Division, deals with the topic "Agstone Used in Illinois in 1944."

A total of 4,214,600 tons of agstone was recorded as used in Illinois in 1944, valued at $4,388,886. Figures for 1943 were a total tonnage of 3,221,477 valued at $3,152,608. In 1927 the tonnage was 647,155 with a valuation of $579,639.

In accordance with an Office of Price Administration ruling, an increase of 20 cents per ton in the ceilings for all grades of Tennessee phosphate rock by producers to fertilizer manufacturers went into effect on October 15.

PUMP AGSTONE 150 FEET FROM QUARRY FLOOR TO STORAGE PLANT

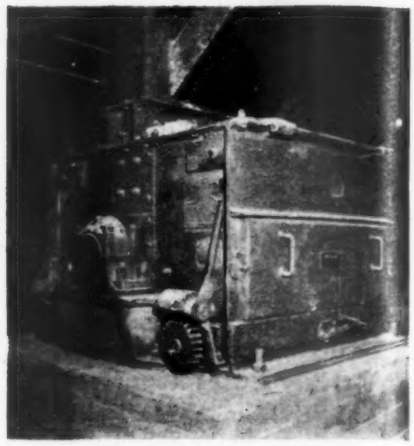
another ON THE SPOT report

By WILLIAM M. AVERY

THE Thomasville Stone & Lime Company, Thomasville, Pennsylvania, has recently completed a plant of unique design for the production of agricultural limestone. One of this company's principal products is fluxing stone for the steel industry, and over a period of years large stock piles of plus-2½-per cent. magnesium stone have accumulated in the quarry. (The specification on flux stone sets the maximum content of magnesium at 2½ per cent.) E. E. Cooke, vice-president and general manager of the company, had urged for a number of years the building of a special plant to process this material into agstone, and the recent installation is not only a fulfillment of this desire but its design and layout are largely Mr. Cooke's own creation.

Since the agstone plant was to be fed entirely from stockpiles in the quarry or from the normal day-to-day output of plus-2½-per cent. magnesium stone, it was obviously desirable to locate the equipment in the quarry. In opposition to this conclusion, however, was the anticipated necessity of shipping at least 50 per cent. of the finished product by railway. A rehandling of the material would obviously have disrupted the economy of the entire operation. Mr. Cooke, accordingly, conceived the idea of *pumping* the finished agstone from the plant to storage bins adjacent to a railway siding on the rim of the quarry.

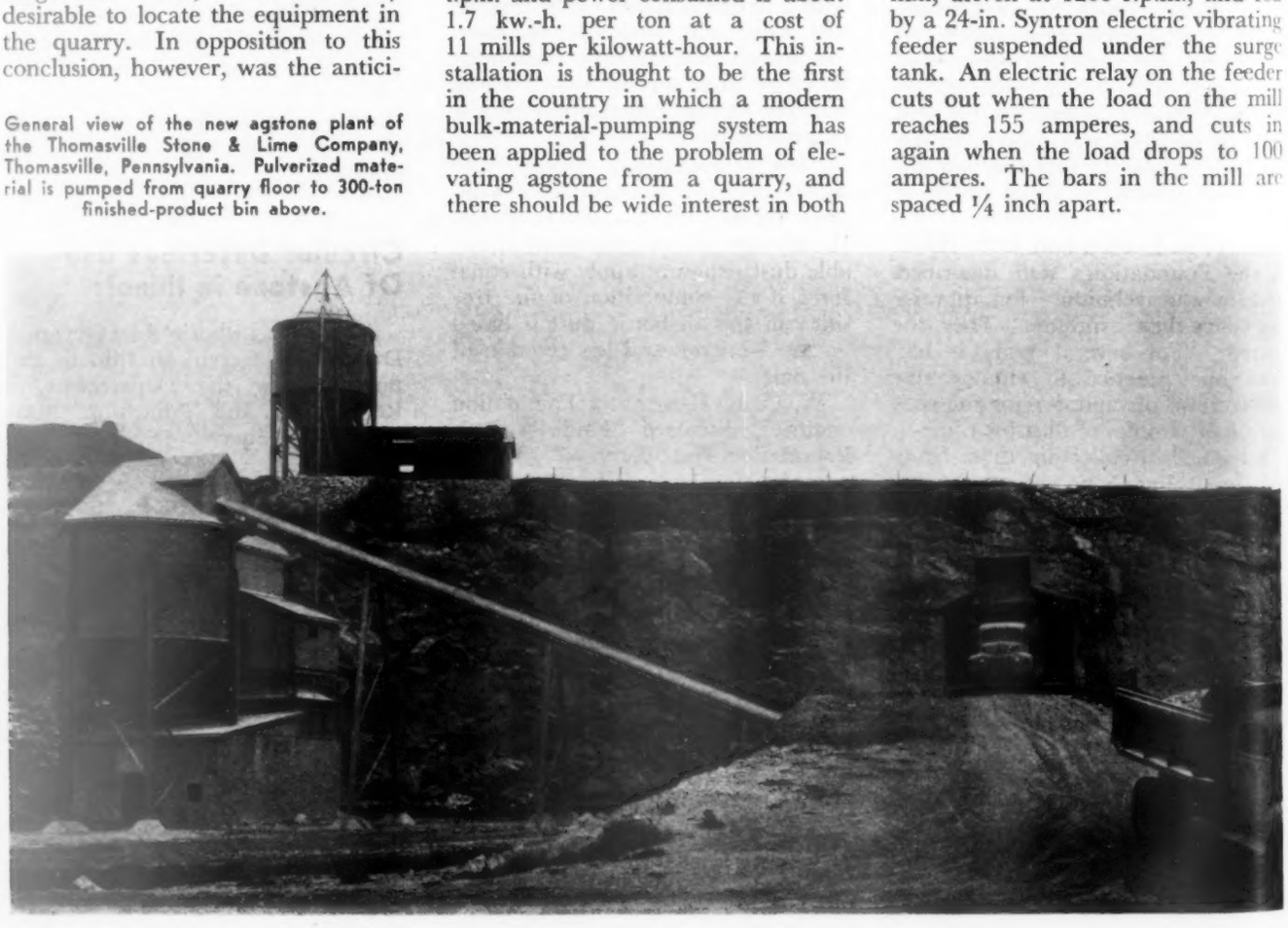
For this unusual operation a 6-in. Fuller-Kinyon Type H-6 pump with a 5-in. discharge was selected. Air is supplied by a 600-c.f.m. 20-pound pressure, Fuller-Kinyon C-120 compressor driven by a 60-hp. motor. The 5-in. flanged pipe line which rises steeply from the quarry floor is 176 feet in length. The difference in elevation between inlet and outlet is somewhat less—about 150 feet. The material is pumped at the rate of 40 t.p.h. and power consumed is about 1.7 kw.-h. per ton at a cost of 11 mills per kilowatt-hour. This installation is thought to be the first in the country in which a modern bulk-material-pumping system has been applied to the problem of elevating agstone from a quarry, and there should be wide interest in both the convenience and the economy of the operation.



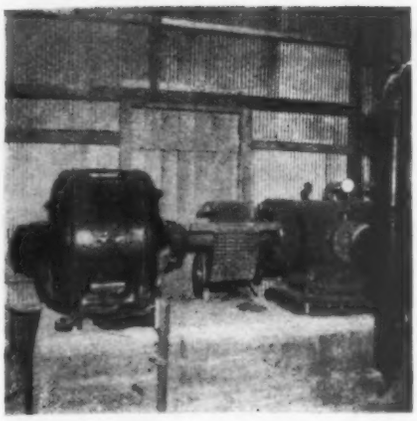
Pulverizing is done by a 48-inch hammermill, fed by an electric vibrating feeder.

Stone is trucked to the new plant and dumped into a steel hopper, from which a 36- by 66-in. reciprocating plate feeder—built in the company's shop—supplies an Earl C. Bacon 18- by 36-in. jaw crusher. This part of the plant is housed in a separate building, from which an 18-in. inclined belt conveyor moves the material to the pulverizing plant, where it is discharged into a 250-ton cone-bottom steel surge tank.

The pulverizing unit is a new 48-in. Pennsylvania C-530 hammermill, driven at 1200 r.p.m., and fed by a 24-in. Syntron electric vibrating feeder suspended under the surge tank. An electric relay on the feeder cuts out when the load on the mill reaches 155 amperes, and cuts in again when the load drops to 100 amperes. The bars in the mill are spaced ¼ inch apart.



General view of the new agstone plant of the Thomasville Stone & Lime Company, Thomasville, Pennsylvania. Pulverized material is pumped from quarry floor to 300-ton finished-product bin above.



Above: The 600-c.f.m. compressor which supplies air for the operation.
Right: View showing crushing building (left) and pulverizing plant (right).

The pulverized material drops into a Jeffrey bucket elevator and is raised about 50 feet and discharged into a feed hopper above a 4- by 10-ft. single-deck Tyler Hum-mer vibrating screen. Minus-20-mesh material passing through the screen drops into a 50-ton steel surge tank, while the oversize flows back to the hammermill by gravity. As nearly as can be determined, about 40 per cent. of the total load on the hammermill is circulating. In the first 310 hours of operation, the highest rate of production reached on the hammermill was 20.55 t.p.h. The average for the 310 hours was 19.65 t.p.h.

As mentioned earlier in this article, the pulverized material is pumped from the 50-ton surge tank to a 300-ton finished-product tank located on the rim of the quarry. Material from the cone-bottomed tank can be loaded directly into trucks on the truckway under the tank, spouted into cars on the adjacent railway siding or fed by gravity to the small packing plant, and if necessary all three of these operations may be carried on simultaneously. A Valve Bag packer set up in the packing plant can bag the material at the rate of 15 t.p.h. At present about 50 per cent. of the plant's production goes out in trucks, and the remainder, both bulk and bagged, in railway cars. The company operates 9 Baughman spreaders mounted on General Motors trucks for direct delivery to farms. Sales of agricultural limestone are made to the A.A.A., farm co-operatives and to local individuals.

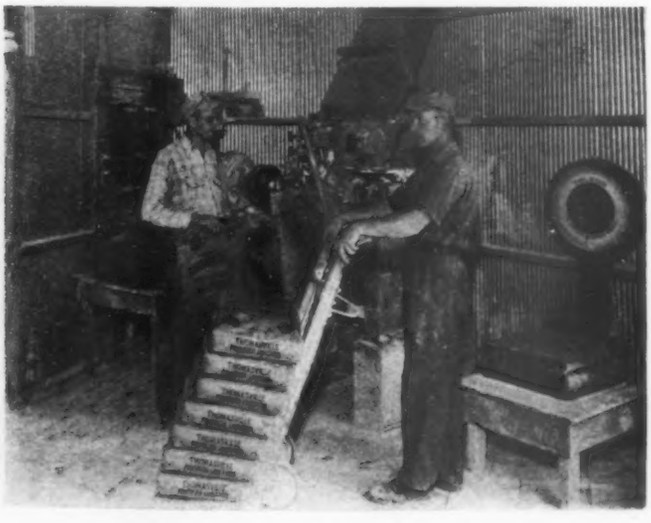
A particularly interesting feature of this plant is the low labor cost achieved. The 250-ton surge tank makes it possible to operate the pulverizing plant an extra shift at night with only one man. On the day shift, of course, an additional man is required at the crusher. Operating in this manner the best day's production so far has been 380 tons of agstone — 100 per cent. passing the 20-mesh screen — with the crusher running 9 hours and the hammermill running 19 hours.

Low consumption of power throughout the operation is another achievement of which Mr. Cooke is justly proud. With power costing the company 11 mills per kw.-hr., the crushing operation consumes only 1 kw. hr. per ton of stone processed, or a cost of 11 mills per ton. Cost on the grinding mill runs somewhat less than 47 mills per ton, and the pumping system is operated at a power cost of less than 19 mills per ton. Mr. Cooke believes that these costs compare very favorably with any that can be found in the country at present.

Eventually the company plans to reclaim the considerable tonnage of material now stockpiled in the quarry, thus recovering the 55 cents per ton invested in stripping, drilling and blasting. For the present, however, the new agstone plant can operate very well on the normal output of plus 2½ per cent. magnesium stone, and the stockpiles

(*Continued on page* 116)

Below, left: Scene in the packing house, showing the single-spout packer and the 100-pound scales.
Right: The storage and packing plant and four of the company's spreaders being loaded. Note pump line, which has been trussed with cable to span railway siding.



Non-Metals Used in Construction Began Upward Trend Late in 1945

THROUGHOUT the latter part of the war, when most of the war projects had been built and emphasis was being placed on the manufacture of weapons, and materials of war, there was a drop in the demand for the products of those industries which depended largely on construction for their outlets. The demand for materials used in manufacturing increased even above the high levels already experienced.

With the end of the war the situation again changed. The demand for construction materials had increased considerably by the end of 1945 and further increases can only be checked by long-continued strikes and material shortages. The end of the war brought cancellations of war orders and a consequent sharp decrease in the demand for some materials. Reconversion and the confused labor situation are holding down production only temporarily and the demand for most such products should soon return to high levels.

There are only a few nonmetallic minerals which will not be in demand when peace-time construction and production get into full swing. Among these are graphite and mica which cannot compete in quality with imports. Bauxite production also may never again reach high levels as the best deposits in this country are nearly depleted and cannot compete with those in the Guianas. The demand for aluminum may never again reach the peak levels of the war years when ill-advised emphasis on its production

Panorama of Silica Products, Oregon, Ltd., Eugene, Ore., showing north settling pond, screen house (above bins) and dryer.

brought bauxite production up to ridiculously high levels. For practically all the other nonmetallics the future seems bright as a well-balanced industrial-construction period will call for large quantities of these materials whether they are used primarily in construction, for agriculture, or for any of many manufacturing purposes. The year 1946 should see a general increase in the total production of these materials.

1944 The year 1944 was one of new production records for most of these minerals including phosphate rock, salt, bentonite, fluorspar, barites, and lithium minerals. Increases over 1943 were achieved in the production of mineral wool, feldspar, sulphur, roofing granules, Fuller's earth, calcium chloride, ball clay, boron, sodium sulfate, and asbestos. Among those showing decreases from the 1943 level were: lime, talc and pyrophillite, gypsum, magnesite, kaolin, abrasive materials, fire clay, and celestite.

1945 Only partial information is now available on 1945 production and this on only a few industries. It seems quite certain, however, that the production of lime, gypsum, fluorspar, sulphur and barites showed gains over 1944. Others undoubtedly also gained and it seems quite certain that the total production of these materials was over the 1944 volume.

Left: Complete installation of new inclined-type furnace at the Provo Lime Company, Provo, Utah. Concrete-block building encloses lower end. Right: Side view of the inclined furnace, showing the outlet stack and exhaust fan.

Lime The production of "open-market" lime and refractory dolomite in 1945 apparently dropped from 5 to 10 per cent. below the 1944 output of 6,473,563 tons which in turn was 2 per cent. below the all-time high of 1943. This condition was again partly due to the shortage of labor which was accentuated by the fact that the lime industry in general is one of the least mechanized of all industries. Refractory or "dead-burned" dolomite output rose about 1 per cent. from the 1943 level to 1,290,790 tons in 1944. Because of the drop in steel production since the end of the war the 1945 volume was probably somewhat lower.

The future prospects for the lime industry are very bright because of the huge construction program. Several large producers have already shown their confidence in the future of the industry by starting extensive expansion programs. Outstanding is the program of the National Gypsum Co. which is building a large new lime plant at Kerns, Va. This will be a duplicate of the company's Bellefonte, Pa., plant which has two 450-ft. rotary kilns.

Gypsum The gypsum industry during the first half of 1944 continued the downward trend which began early in 1942. This was due largely to the decline in construction volume and was greater than the increase in non-constructional demands. With the end of the war and the relaxation of construction restrictions the construction demand rose in common with all building materials. In the third quarter of 1945 this increase outweighed a slight decrease in the demand for other uses. According to the U. S. Bureau of Mines the amount of crude gypsum mined in that quarter in the United States was 5 per cent. above the same period last year.

The future prospects of this industry are very bright indeed, as anyone might deduce from the large plant construction and improvement programs now under way. The most impressive program, that of the National Gypsum Co., involves the expenditure of $8,500,000 and includes the construction of a new $2,000,000 gypsum products plant at Baltimore, and the expansion of the plants at Savannah, Mobile, and Rotan, Texas. Two 10,000-ton vessels purchased from the Canadian Government will be used to transport gypsum rock from the company's Nova Scotia quarries to its East Coast plants.

The Standard Gypsum Co. has already started preliminary work on its new plant at Richmond, Cal. Included will be a wallboard plant with a capacity of 200,000 square feet daily, a calcining plant, etc. The company's Long Beach plant will be reconditioned and expanded in the near future.

Phosphate The production of phosphate rock set a new record in 1944, the quantity sold or used by producers reaching 5,376,643 long tons. The active producing states were Florida, Tennessee, Montana, Idaho and Virginia. The Western states again set a new record, 298,999 long tons in spite of inactivity in Utah.

In 1945 there was increased activity in Idaho and there is little doubt that total production again increased.

The postwar outlook for the industry is good as the cessation of hostilities reopened the export market which formerly took a large part of production. In spite of the slow recovery in Europe this should overbalance the expected drop in the abnormally-high domestic consumption which was based on the war-stimulated farm income, and in industrial and chemical uses.

An outstanding plant development of the year was the new hard-rock operation of C. & J. Camp, Inc., and J. Buttgenbach Co. near Dunnellen, Fla. This is the only such plant in the state and its average capacity is about 40 tons per hour. It was completely described in the July, 1945 issue of PIT AND QUARRY. Many other Florida producers made important improvements and more are planned. The year 1946 apparently will see rapid development of the industry in Idaho where several new plants are planned.

Magnesite The production of magnesite and other magnesium raw materials in 1944 dropped to 561,450 tons from the 1943 record level of 754,832 tons. This was due largely to the decrease in magnesium metal production which had far exceeded actual war needs. No figures for 1945 are yet available but it is probable that further losses were incurred. Little change is expected in the early postwar years.

Industrial Clays According to the U. S. Bureau of Mines 17,295,328 tons of clay was sold or used in 1944. About 40 per cent. of this was used in heavy clay products, 31 per cent. in refractories, 16 per cent. in portland cement, 3 per cent. in paper, 2 per cent. in pottery, and the remainder for a wide variety of other purposes. Some clays used for industrial purposes fared well while those serving the construction field were at a very low ebb.

General view of the new hard-rock phosphate plant of C. & J. Camp, Inc., and J. Buttgenbach Co., near Dunnellen, Fla., showing skip car feeding matrix to plant at extrem eright, and finished product being loaded into open-top car on extreme left.

The Fuller's earth production of 294,737 tons in 1944 was a near record, continuing the upward trend beginning in 1940. This constitutes a remarkable record as the production of this material had fallen steadily since 1930. About 60 per cent. of the production was used for mineral oil refining.

Bentonite production also increased 16 per cent. in 1944 to a volume of 546,768 tons. This set a new record for the sixth consecutive year. This expansion is largely due to the growing needs of the oil industry for rotary drilling mud. For this reason the future prospects of the industry are exceedingly bright and 1945 was probably another record year.

Because it is used largely in the manufacture of types of paper of which there has been a shortage during the war the production of kaolin again fell in 1944. The output of 873,056 tons was 6 per cent. under the 1943 level. The 1945 volume was probably no greater but the industry should again prosper as paper becomes more plentiful.

Fluorspar The production of fluorspar in 1944 totaled 413,700 tons, topping the 405,600-ton record output of 1943. It is not yet known whether 1945 production again set a record but this seems doubtful because of the drop in steel production in recent months. The output through May was at a high level and May was the seventh consecutive month in which output fell short of consumption.

The future outlook for the industry is bright as the industries to which it sells will all rise with the construction volume and general business conditions.

Feldspar In spite of labor shortages and continued competition from aplite and imported nepheline syenite the feldspar industry in 1944 produced 316,166 long tons, only 3 per cent. under the record year of 1941. Sales of ground feldspar continued at a high level.

No figures for 1945 are yet available but it probably continued at a high level. Because most of the feldspar produced is used in the manufacture of glass, glassware, pottery, enamels, etc., the postwar outlook for this industry is very good and a new record may be set in 1946 if labor difficulties are settled.

Sulphur The production of sulphur in 1944 reached a near record level of 3,218,156 tons, 27 per cent. over 1943, and nearly as large as the record 3,460,686-ton output of 1942. Apparent sales were 3,580,057 tons, the largest on record, and stocks at the end of the year were at the lowest level in several years.

This condition got 1945 off to a good start and each month through August was at a high level, averaging nearly 30 per cent. over the first eight months of 1944. In August, the month the war ended, and the last on which we have information, the production of native sulphur was the highest of any month in history. In each month sales exceeded production but in August production finally overtook sales. Because munitions took a large part of the output sales probably dropped off sharply during the last few months of the year. Production, however, probably dropped less sharply in order to build up stocks.

The outlook for 1946 is good but production will undoubtedly be considerably below the record war levels.

Salt The 15,717,171 tons of salt produced in 1944 set a new record, being 3 per cent. over the 1943 volume. This was due almost entirely to the increased manufacture of synthetic rubber which required 140,000 tons compared to 66,000 tons in 1943. This growing use undoubtedly caused production to again set a record in 1945. For the same reason the early post-war years should stay at a high level as civilian supplies during the war years were held down by war needs.

Talc and Pyrophyllite The mined production of talc, pyrophyllite, and ground soapstone declined in 1944 from the high levels of 1943 to a volume of 418,228 tons. The production early in 1945 was high but the end of the war undoubtedly caused a sharp drop due to certain war-stimulated uses.

The future prospect is that demand will stay at a moderately high level to meet peace-time demands. The resumption of imports from European and Asiatic countries will probably keep domestic production down.

Abrasive Materials The output of abrasive materials in 1944 totaled 1,340,909 tons, only slightly under 1943. Ground sand and sandstone rose to new highs and increases were made by diatomite, emery, pumice, pumicite and tripoli.

Mineral Wool The production of mineral wool in 1944 reached a level of 568,296 tons in 1944, a slight increase over 1943. Apparently the new uses for industrial and war purposes compensated for the loss in house insulation due to the low construction volume. This condition undoubtedly continued through the end of the war and there was probably little change in volume in 1945.

The postwar outlook for this material is brighter even than that of most other materials used in construction as it is still a comparatively new product and had only begun to realize its potentialities when the war began.

Roofing Granules The output of roofing granules of all kinds in 1944 totaled 990,000 tons, 13 per cent. over 1943. Artificially-colored granules showed the greatest gain and formed nearly two-thirds of the total. As building maintenance rather than new construction is the major outlet there probably was no loss in output in 1945. Future prospects may be gauged by the huge expansion program planned by the industry.

Phosphate Production In First 6 Months of 1945

Total mine production of phosphate rock in the first half of 1945, according to reports of producers to the U. S. Bureau of Mines was 2,773,894 long tons. Phosphate rock sold or used in the first half of 1945, 2,629,669 tons, was slightly less than the corresponding period of 1944; the value, $10,567,775, was about $385,000 greater. The average value of the phosphate rock sold or used increased from $3.80 in the first half of 1944 to $4.02 in the similar period of 1945.

In the first half of 1944, phosphate rock was mined in Florida, Tennessee, Idaho, and Montana, and apatite in Virginia. Florida was the leading shipper as usual, its marketed production being nearly three times that of its nearest competitor, Tennessee. The quantity of Tennessee rock sold or used in the first half of 1945 was considerably greater than in the corresponding period of 1944, and there was a considerable increase in the total value. Idaho showed an increase in the quantity of phosphate rock sold or used in the first six months of 1945 over the January-to-June period of 1944. Both average and total values also increased.

CEMENTS, CRUSHED STONE, AGSTONE AND ROCK WOOL MADE FROM ONE DEPOSIT BY THE CARNEY COMPANY

THE Carney Co., Mankato, Minn., manufacturers of natural and masonry cements for 62 years, is carrying out a program of expansion which will enable it to obtain the fullest benefit from its very unusual quarry and from the post-war building boom. This quarry has four distinct ledges, each suited for a different product. The top ledge—16 feet of dolomite—is best suited for crushed road stone. This is actually four 4-ft. ledges separated by thin clay seams. Next comes 4 feet of shale which is blended with slag for rock wool manufacture, 9 feet of hydraulic limestone for masonry cement, and 9 feet of argillaceous limestone for natural cement. The two top layers are comparatively soft but the others are hard enough for concrete aggregates or railroad ballast.

This is an ideal combination but, up until now, company officials would have been much happier if the order in which these ledges occur had been reversed. The original cement plant is located at a quarry, since abandoned, about 5 miles from the present quarry. For many years, therefore, it had been necessary to remove the two top ledges of stone in order to get at the two bottom ledges, an expensive and wasteful procedure. In 1930 the problem was partly solved by the opening of a new rock-wool plant near the quarry.

At the same time was begun the production of natural cement to be blended with portland cement for scale-resistant concrete roads.

This left only the top layer of dolomite to be removed, in addition to the light dirt overburden. The war, however, decreased the cement demand to such an extent that this plant was shut down and production was concentrated on rock wool. In order to remove the top layer an arrangement was then made with a contractor to quarry the dolomite for use as roadstone on his highway construction contracts. This arrangement worked out very well and uncovered enough cement rock for a long period of operation. It was then decided to reopen the cement plant early in 1946 and, in order to insure the steady removal of the top rock it was decided to install a combination crushed stone and agricultural limestone plant at the quarry. This went in operation on November 15 with considerable fanfare, the governor and other state, civic, and industrial leaders being present at the formal opening.

The present setup now makes it possible for the company to use in its own plants the material from all four ledges. The daily output is expected to include 40 tons of agstone and 60 tons of crushed roadstone, plus considerable quantities of rock wool and natural and masonry cements. The demand for these products will determine the hours of operation and the flexibility of the plant will make it possible to produce agstone when desired.

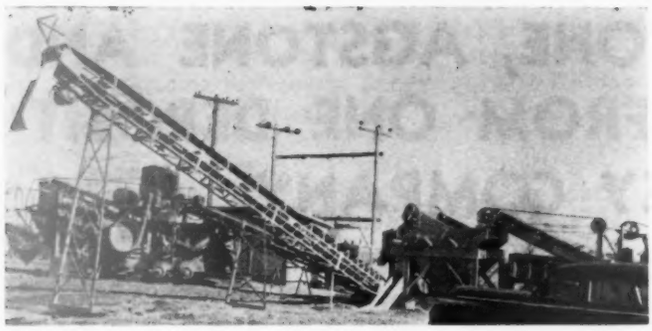
A coöperative plan was worked out whereby the Lundin Construction Co. of Mankato furnishes the power shovel, trucks, intermediate crushing unit, certain conveyors and the operating force, while the Carney Co. performs all drilling and blasting operations and furnishes the primary crusher, vibrating screens, pulverizer, and other conveyors as well as the derrick for loading finished products on the cars for rail shipment. By thus using available equipment the long delay of waiting for new equipment was avoided.

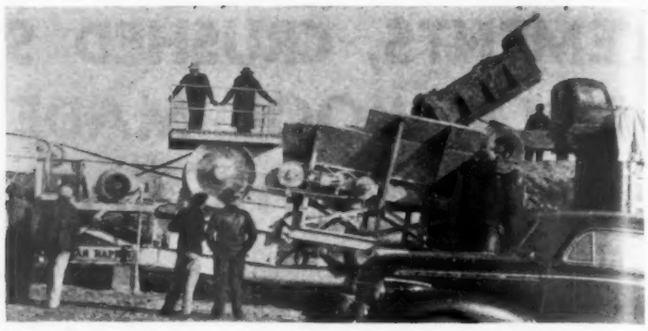
In the quarry drilling is done with an Ingersoll-Rand wagon drill and Jackbits, and a compressor of the same make. Trucks are loaded by a Link-Belt Speeder shovel from the top three ledges.

Considerable flexibility is possible in operating the quarry. When cement stone is not needed only the top ledge of rock is worked. When cement rock is needed the third ledge is worked and any or all the stone can be used for cement or for other products as desired. The fourth layer is not suitable for agstone so it is hand loaded into skip boxes and loaded by a derrick into cars for the vertical cement kilns.

The trucks discharge the rock from a ramp on a heavy-duty apron feeder ahead of the 25- by 40-in. Cedarapids primary jaw crusher. This feeder is clutch operated for feed control. A belt-conveyor carries the stone to the 4- by 8-ft. Cedarapids 3-deck vibrating screen which has 4-in. and 2-in. wire cloth on the two decks now in use.

In this view are shown the under-track conveyor, agstone hammermill, and car-loading derrick at left. At right is the crushed-stone plant and its carloading conveyor.





Above: The crushed stone plant and its car-loading conveyor with part of the preliminary-sizing plant at right. Right: Truck dumping rock on the apron feeder to the primary crusher.

The 2- to 4-in. rock over the bottom deck of the screen is used for the production of agstone. This rock is carried on a 24-in. by 55-ft. belt-conveyor under the railroad tracks to a 24-in. by 50-ft. inclined conveyor. This feeds the rock into the 36- by 40-in. Dixie Premier hammermill which is mounted on a concrete pier extending 9 feet above ground level. This provides sufficient elevation so that the finished agstone can be chuted on a 40-ft. swinging boom conveyor for discharge to a stockpile in a 40-ft.-deep worked-out quarry. A 24-in. by 45-ft. Cedarapids conveyor at this screen is used for loading cement stone into railroad cars for the cement plant.

The rock over 4 and under 2 inches in size from this screen is discharged from the above screen on a 40-ft. belt-conveyor to a No. 65 Diamond portable crushing and screening plant. The fines in this stone carry the clay which would be objectionable in agstone but is desirable in the roadstone. This plant has been mounted on jacks and has a 10- by 36-in. jaw crusher, a 20- by 30-in. double roll crusher, and a 3-deck screen. Trucks or cars can be loaded direct by a swinging chute or the stone can be carried on a 52-ft. under-track conveyor to a 20-ft. swinging boom conveyor for stockpiling in the same hole. This plant now produces minus-¾-in. roadstone but can also be used for railroad ballast.

Present plans are to stockpile 10,000 tons of stone and the same amount of agstone in this hole. An American Hoist & Derrick Co. stiff-leg derrick with a 90-ft. boom and a 2-cu. yd. clamshell bucket loads from both piles into railroad cars for shipment.

The company is not competing for the local agstone business but holds a 50,000-ton contract to supply counties in northwestern Iowa where suitable stone is scarce. Shipments are also made by rail to southeastern Minnesota areas where deliveries will be made by truck by local non-rail producers. The Lundin company will take local contracts for agstone and has exclusive rights within a 45-mi. radius of the plant. Lundin is also the trucking contractor for the delivery of road stone.

Stone for the cement plant is delivered in 15 railroad gondola cars owned by the company, through a special switching arrangement.

All the plant equipment is electrically driven except the Diamond portable plant, which is driven by a 100-hp. Buda diesel engine, and two of the conveyors, which are driven by gasoline engines. The primary jaw crusher is driven by a 100-hp. Louis Allis electric motor and the hammermill by a 150-hp. Fairbanks-Morse motor.

Responsible for the planning and construction of the crushing plant are: H. E. Carney, Jr., president; W. B. Lee, treasurer and general manager; K. A. Gollmar, secretary; N. A. Holmer, general sales manager; C. E. Lovewell, chief engineer; William Duane, chief chemist; and Frank Kennard, manager of crushed stone sales, all of the Carney Company, Inc. Hilding Lundin of the Lundin Construction Co. will have general supervision of the quarry and the crushing plant.

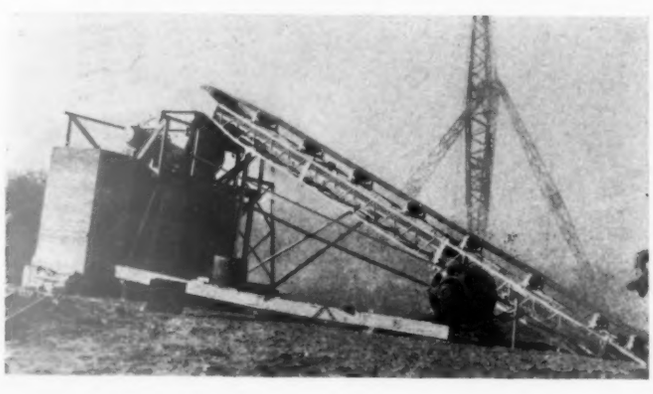
Left: Under-track belt-conveyor which feeds agstone hammermill. Right: The stratification of stone in quarry is evident in this view of shovel loading.

Safety Color Code for Marking Physical Hazards

A safety color code for marking physical hazards has been announced by the American Standards Association. Developed by one of the association's war committees, the code is intended to unify on a national scale the colored markings commonly employed to warn workers of specific dangers, to mark the location of safety equipment and to identify additional protective equipment. The code deals fully with use of color in marking safety cans, fire sirens, posts, handrails, unguarded edges of platforms, location of gas masks, etc.

The association also has published a list of approximately 800 industrial standards, some of which apply to the mining industry.

The Pit and Quarry Handbook and Directory are the only ones in the nonmetallic minerals industries; the most complete in any industry.



EXPERTS GIVE POINTERS ON TRACTOR-SCRAPER OPERATION

SECTION I — HOW TO INCREASE SCRAPER EFFICIENCY IN MATERIAL, OVERBURDEN REMOVAL

By ROBERT D. EVANS
Chief Field Engineer,
R. G. LeTourneau, Inc.

BECAUSE it is one-man operated, yet loads, hauls and spreads its own load, the tractor-scraper rig has found a ready acceptance among pit operators as a quick, low-cost method of removing overburden, handling aggregates, building roads and performing numerous other earthmoving jobs.

This discussion was prepared for readers of PIT AND QUARRY to assist them in obtaining the maximum efficiency from such equipment, and to acquaint them with some of the results that are obtainable.

Helpful Loading Hints When loading scrapers, better performance will result if downhill loading is practiced, or straddle loading methods are employed.

By loading downhill you employ gravity as power help. This gives much the same effect as a pusher tractor in acting as a loading force. Downhill loading will enable you to take a deeper cut, will help the material "boil" into the scraper quicker, and puts less strain on your prime mover.

Straddle loading is another means of getting bigger loads quicker. To straddle load, leave about four or five feet between your successive scraper cuts. The ridge of the material left between the cuts offers less resistance than full cuts. After the two full width loading passes are completed with the mid-section left between, the operator returns to complete his third pass over the ridge-like material.

Robert D. Evans

Faster and easier loading results from both downhill and straddle loading. Both methods may be separately or jointly followed over an entire loading hillside or flatter job surface.

Below: Diagrams showing (left) right and wrong methods of performing down hill and straddle loading, and (right) rooter operating methods.

Uses of Pusher for Loading Pusher tractors are used to load scrapers whose heaped capacities exceed 15 cubic yards, to load scrapers when the material is hard and to load scrapers in fleet use.

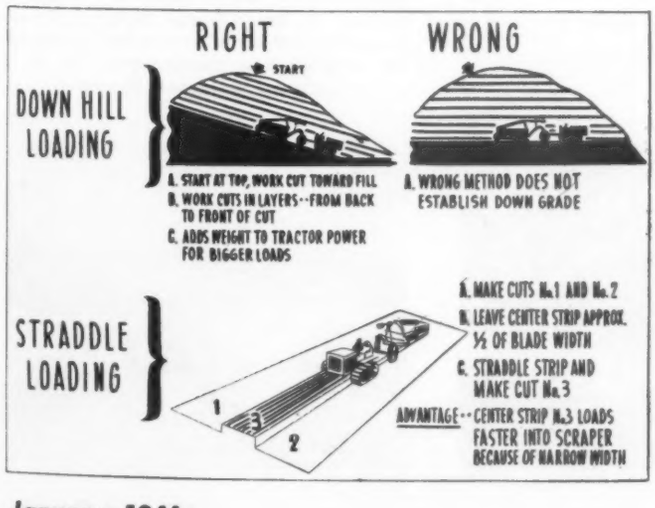
In the first case, the reason is obvious. The limit of the largest tractors is about 12 to 15 heaped-yards without the aid of downgrade loading. Because these large tractors can haul loads in excess of 15 heaped-yards, large scrapers are economical on many jobs involving long hauls.

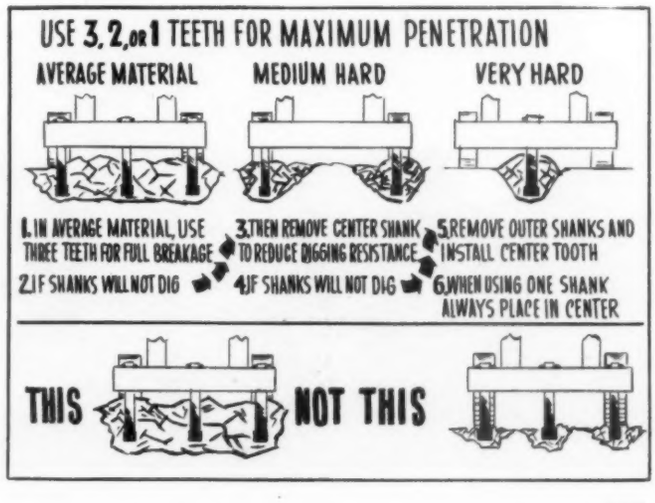
In the second case, hard materials prolong loading time, materially decreasing production and efficiency. When the loading time exceeds 1.5 to 2.0 minute at a maximum, auxiliary loading help should be used.

In the third case, with scrapers of less than 15 yards heaped, pushers increase loads and/or reduce loading time. By pro-rating the pusher cost over the fleet, low costs are realized.

Some users prefer snatch or pull loading, wherein a chain or cable is hitched to the nose of the tractor. Regardless of push or snatch methods, the "pocketbook" question of operation is generally the same. See accompanying table for pay-yards gained in 60 operating minutes with a pusher tractor of approximately 115 horsepower operating in common earth.

Operating the Pusher When operating a pusher, keep your units in a straight line to avoid jack-knifing tractors and


RIGHT
WRONG
DOWN HILL LOADING
START
A. START AT TOP, WORK CUT TOWARD FILL
B. WORK CUTS IN LAYERS--FROM BACK TO FRONT OF CUT
C. ADDS WEIGHT TO TRACTOR POWER FOR BIGGER LOADS
A. WRONG METHOD DOES NOT ESTABLISH DOWN GRADE
STRADDLE LOADING
1
2
3
A. MAKE CUTS No. 1 AND No. 2
B. LEAVE CENTER STRIP APPROX. ½ OF BLADE WIDTH
C. STRADDLE STRIP AND MAKE CUT No. 3
ADVANTAGE--CENTER STRIP No. 3 LOADS FASTER INTO SCRAPER BECAUSE OF NARROW WIDTH


USE 3, 2, OR 1 TEETH FOR MAXIMUM PENETRATION
AVERAGE MATERIAL
MEDIUM HARD
VERY HARD
1. IN AVERAGE MATERIAL, USE THREE TEETH FOR FULL BREAKAGE
2. IF SHANKS WILL NOT DIG
3. THEN REMOVE CENTER SHANK TO REDUCE DIGGING RESISTANCE
4. IF SHANKS WILL NOT DIG
5. REMOVE OUTER SHANKS AND INSTALL CENTER TOOTH
6. WHEN USING ONE SHANK ALWAYS PLACE IN CENTER
THIS
NOT THIS

Distance	Single Scrapers Capacities in Heaped Cubic Yards				Fleet of Scrapers Capacities in Heaped Cubic Yards			
	19	18	15	11	76	72	60	44
400	48	45	22	13	192	180	88	52
600	36	34	15	9	144	136	60	36
800	30	28	12	7	120	112	48	28
1000	23	22	8	4	92	88	32	16
1200	20	19	7	3	80	76	28	12
1500	17	16	5	2	68	64	20	8
2000	13	12	4	1	52	48	16	4

scraper. Make contact with the pusher block easily. Don't slam into the scraper. Both tractors and scraper take a beating if you do. Contact the pusher block squarely, particularly if you are using a 'dozer as a pusher. Use caution when breaking the contact. If you slip off the pusher block, the blade may ruin a tire or gouge the scraper.

Be sure to watch the lead "cat." When it "revs" up, you want to "rev" up the pusher tractor. When it lugs down, you want to lug down the pusher. Keep the lead "cat" out of the way of the pusher. Do not sandwich your scraper at any time.

Step-Push Loading Many operations lend themselves to the step-push method, another wise fleet operation. In step-push loading, your scrapers maintain opposite flows of traffic into the borrow pit, rather than all coming from the same direction.

Thus the "interlacing" pusher tractor is able to literally "step" from one line to the other, without having to wait or go back to meet another scraper. The tractor merely step-pushes one scraper until it gets a bowlful, and then pivots to immediately contact the second opposite direction scraper and give it the same valuable aid.

On an average scraper fleet the step-push method will save 0.5 of a minute per load over more conventional methods. That ½ minute, dependent on the loading material and the size of the scraper, can be nearly time enough for another half-load. The fixed time savings thus attained on a complete cycle reduces yardage costs.

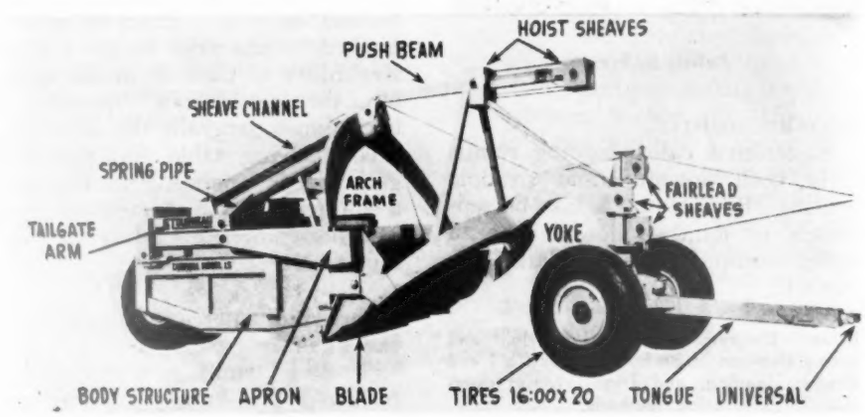
Rooting Pays Another way to save loading time is to use a rooter in conjunction with scraper operations. The rooter can be pulled by the pusher tractor, and do its rooting between pusher loadings. The rooter also enables the scraper to operate in a wider range of materials, such as shale, sandstone, decomposed granite and even concrete. Using a rooter eliminates the expense of blasting and sometimes rules out the need of shovels.

Maximum penetration is Rule No. 1 of rooter operation. Get the full digging depth of the shank. This results from using one, two or three shanks according to the degree of hardness of the material. In other words, the resistance to digging created by three teeth in very hard material can be reduced by removing one or two shanks. In average materials, increased resistance may cause shanks to ride out of the ground; therefore, the center shank should be removed. In the hardest materials, one shank in the center will produce best results. Observation of the rooter at work will quickly determine the number of shanks required.

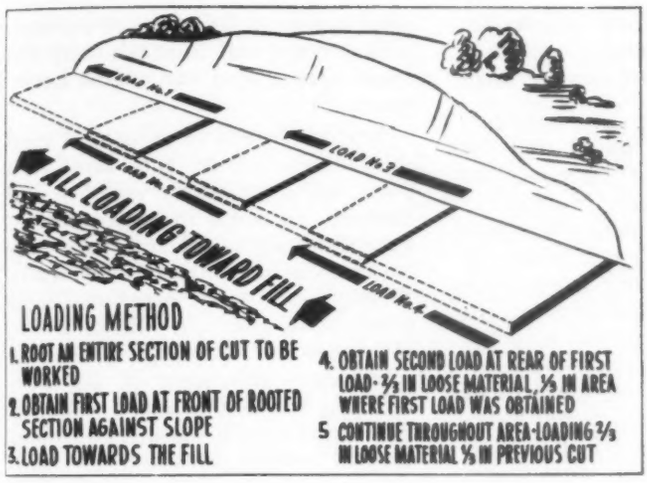
Always remove shanks so the line of pull is in the center of the rooter body. If two shanks are used, the center shank should be removed. If only one shank is in use, the two outer ones should be removed. Removed shanks can be inverted in their slots in many cases, and their weight will assist the digging action.

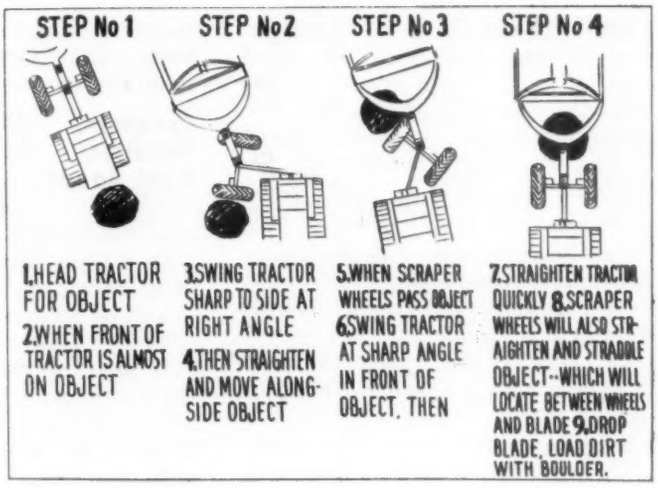
Job Planning with Rooters In the loading of rooted materials, it frequently will be found that the broken ground does not create a force which will push or help material into the bowl. Instead, the loose material has a tendency to ride ahead of the blade. Therefore, it is often wise to:

(a) Root an entire area before the scrapers start to work, or



Left, upper: Diagram of the Engineer Scraper. Left, lower: Illustration of snatch loading, similar to pusher loading. Below: Scraper in process of wrinkle-loading (straddle loading) in a demonstration for U. S. Engineers at Toccoa, Georgia.


LOAD No.1
LOAD No.2
LOAD No.3
LOAD No.4
ALL LOADING TOWARD FILL
LOADING METHOD
1. ROOT AN ENTIRE SECTION OF CUT TO BE WORKED
2. OBTAIN FIRST LOAD AT FRONT OF ROOTED SECTION AGAINST SLOPE
3. LOAD TOWARDS THE FILL
4. OBTAIN SECOND LOAD AT REAR OF FIRST LOAD-⅓ IN LOOSE MATERIAL, ⅙ IN AREA WHERE FIRST LOAD WAS OBTAINED
5 CONTINUE THROUGHOUT AREA-LOADING ⅔ IN LOOSE MATERIAL ⅙ IN PREVIOUS CUT


STEP No 1
STEP No2
STEP No 3
STEP No 4
1.HEAD TRACTOR FOR OBJECT
2.WHEN FRONT OF TRACTOR IS ALMOST ON OBJECT
3.SWING TRACTOR SHARP TO SIDE AT RIGHT ANGLE
4.THEN STRAIGHTEN AND MOVE ALONG-SIDE OBJECT
5.WHEN SCRAPER WHEELS PASS OBJECT
6.SWING TRACTOR AT SHARP ANGLE IN FRONT OF OBJECT, THEN
7.STRAIGHTEN TRACTOR QUICKLY 8.SCRAPER WHEELS WILL ALSO STRAIGHTEN AND STRADDLE OBJECT--WHICH WILL LOCATE BETWEEN WHEELS AND BLADE 9.DROP BLADE, LOAD DIRT WITH BOULDER.

Left: Diagram of scraper loading of rooted materials. Right: Method of loading boulders and other large objects.

divide the area, keeping scrapers on one side, rooter on the other.

(b) Use a method that will overlap loads, such as taking 2/3 of the load from the rooted material and the final 1/3 from the section ahead where the previous load was obtained. This front section contains material that is more firm and will provide resistance that greatly assists in obtaining the last 1/3 of the load.

How to Load Large Objects So far, we have covered the basic methods of loading to make most effective use of prime mover power. Now let's get down to details on how to handle various types of material for scraper loading. Possibly the first task on many jobs is removal of large rocks and stumps from the overburden.

If the rock or stump is too large to drive the tractor over and too large for the front axle structure to pass, have your operator come straight toward the center of the object. When the nose of the tractor reaches the object, he can swing the "cat" either right or left, so the tractor and the front wheel of the scraper fall on either side of the object. When the tractor and front wheels of the scraper are alongside, he should cut short toward the rock or stump and, at the same time, drop the scraper cutting edge to the ground. At this point the tractor and scraper are in line and the object is between the front wheels and the cutting edge. With the scraper's apron raised to its full height, the operator may now pull forward, loading the rock into the bowl.

By this method you can load any object into the scraper which will pass through the apron opening. It is sometimes necessary to load a little dirt into the scraper in order to push the object far enough back to let the apron close, after which the scraper is ready to be raised and hauled. Unloading is accomplished by ejection, immediately after which the "cat" is turned sharply, either direction, so the rear of the scraper will not foul on the unloaded material.

Average materials (common earth, shale, clay, etc.) load best by constant forward motion of the tractor. When loading average dirt or clay, as in overburden:

(a) Raise the apron four to eight inches, with ejector section all the way to rear of the scraper bowl.

(b) Lower the blade into the ground as the tractor is moving.

(c) Regulate cutting depth of the blade to maintain steady forward travel at full engine r.p.m.

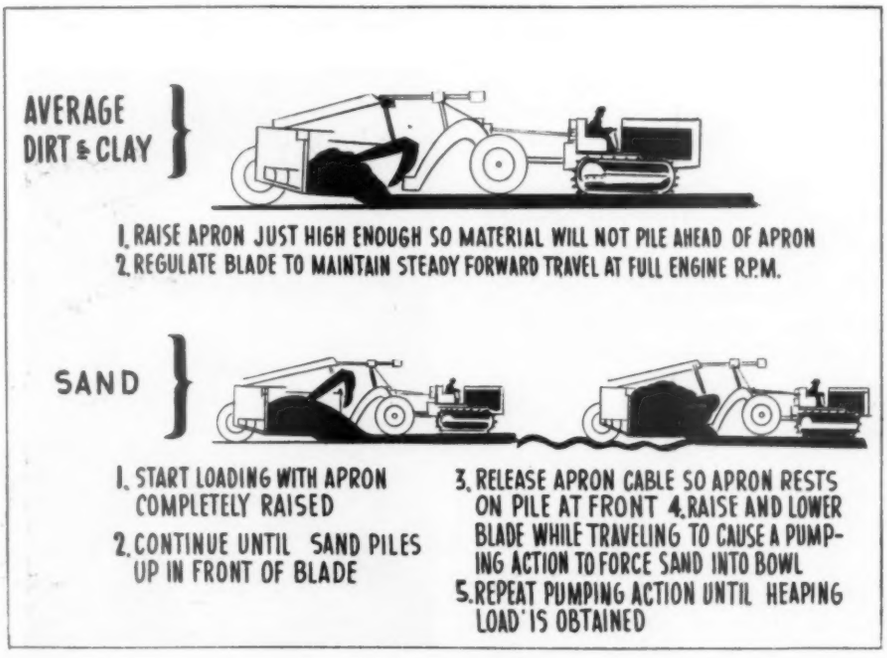
(d) Travel until a heaping load is obtained.

(e) Use the power control unit to release the apron and close the bowl.

(f) Raise the bowl a few inches and travel a short distance to level the material in front of the apron, thus helping maintain a smooth and clean work area.

(g) Raise the bowl to the required height for travel and proceed to the fill or point of emptying.

A discussion of some of the above steps is necessary for a thorough understanding of the effect of proper operation. First, the apron should be just low enough to allow the flow of material to enter because the apron carries part of the load. If the apron is too low, material will bank up in front and impede loading. A heaping load can be gotten without necessarily fighting for a last, more costly yard. Finally, for faster loading, always load downhill if possible.


AVERAGE DIRT & CLAY
1. RAISE APRON JUST HIGH ENOUGH SO MATERIAL WILL NOT PILE AHEAD OF APRON
2. REGULATE BLADE TO MAINTAIN STEADY FORWARD TRAVEL AT FULL ENGINE R.P.M.
SAND
1. START LOADING WITH APRON COMPLETELY RAISED
2. CONTINUE UNTIL SAND PILES UP IN FRONT OF BLADE
3. RELEASE APRON CABLE SO APRON RESTS ON PILE AT FRONT 4. RAISE AND LOWER BLADE WHILE TRAVELING TO CAUSE A PUMPING ACTION TO FORCE SAND INTO BOWL
5. REPEAT PUMPING ACTION UNTIL HEAPING LOAD IS OBTAINED

Steps in loading average dirt, clay and sand.

Loading Sand and Gravel The technique changes on sand and gravel. Sandy material does not "boil" into the scraper bowl in normal, forward loading fashion. Therefore, a different system must be used by the operator, using these steps:

(a) Start loading with the apron raised to its full height.

(b) Load until the sand piles up in front of the blade.

(c) Release the apron cable so the apron rests on the sand piled in front.

(d) Raise and lower the blade while traveling, to cause a pumping action, referred to as "pumping in a load."

(e) Repeat the pumping action until a heaping load is obtained.

(f) Raise the bowl to traveling height and proceed to the fill or point of emptying.

The above procedure will produce the largest possible loads in "dead" material. Again, the reason is obvious; sand is the heaviest of all common materials and so does not force easily into the bowl, but requires pumping action to help it into the bowl. Gravel, generally speaking, requires the same treatment as sand.

Scrapers, Grizzlies, Haul Roads Many pit operators have found that the use of ramps and grizzlies or traps in conjunction with scrapers makes possible loading directly into trucks or onto conveyors without extra labor or special loading machinery.

Thus, scraper investment is spread over more operations and more operating hours. Use of the scraper under such conditions depends largely upon the localized set-up. Some indicative illustrations are shown with this article.

Not too much can be said about the importance of good haul roads, particularly in view of the trend to faster operations. Both high speed and tractor rigs suffer when ruts and soft spots force gearshift changes which decrease efficiency, resulting in several lost loads when added together over a daily operational cycle. On high speed Tournapulls, the difference between a "poor" road and a "good" road can easily be calculated to show a difference of as much as between 8 and 20 m.p.h. with the same scraper load and engine horsepower.

It is important to keep haul road dust down. Dust gets into vital parts, ruins operator's visibility and morale, can result in compensation-costing accidents. Haul roads may be light-oiled, stabilized, or watered. If your job is large, occasional light oilings will pay off. Stabilization often can be accomplished by spreading a thin layer of clay over the haul road. The water wagon is the next answer if the first two plans are not feasible. In winter, icy roads should be sanded.

Loaded scrapers going from the borrow pit continually compact the haul road. Returning, scrapers can eliminate equipment-jarring ruts and bumps by literally levelling the road. It is a simple matter, by keeping the tailgate, or other bowl ejection section, forward enough to keep the bowl from picking up dirt while the blade is sufficiently lowered on the return-to-pit travel, to create a dozing effect over the entire haulway.

SECTION II — SCRAPER MAINTENANCE PROBLEMS

By C. F. ZIMMERMAN
General Service Manager,
R. G. LeTourneau, Inc.

Scraper maintenance, like scraper field operation, is really just a matter of common horse sense. When you have a good scraper, all you further need is a capable, safe and thoughtful operator, who is fully aware of maintenance as well as operational economies. In this study of scraper maintenance facts, let's start from the ground up—with the tires.

Since 1932, when R. G. LeTourneau proved pneumatic tires give better flotation to scrapers, and afford smoother, faster hauling than steel wheels, there has been an almost universal trend to rubber on such rigs. Rubber tires operating at lower pressures will stay atop sand and mushy surfaces which tend to bog steel wheels. They will "absorb" small rocks, etc., saving the scraper from excessive jarrings.

Dynamometer tests reveal the lower the pressure in off-road work, the lower the drawbar required. By decreasing drawbar consumption, faster speeds can be used and greater grades traversed with the same power. Rubber tires can carry loads with a minimum of ground surface penetration, and afford more sure-footed action.

Where dual tires are used, balanced inflation is important. Differences of greater than ½ inch in diameter are not good for tires; put your odd sized tires on single front rims, or on other rigs having single-tired wheels. Don't let rocks or wood stay jammed between duals, as they cause failures which are seldom repairable. Keep your tires inflated to recommended pressures, checking them at least once every three shifts.

Over-inflation will cause trouble.

C. F. Zimmerman

Repair at once any deep injuries which penetrate to the cord body of the tire allowing dirt and water to enter. When a tire accumulates a number of small cuts, remove and recondition it at the first opportunity, before deterioration can occur. Keep oil off tires, since oil causes deterioration. Keep your pusher blocks in shape to prevent dozer blades from gouging rear tires. Maintain your haul roads well, and, where blasted or scarified materials exist in the pit or elsewhere, avoid striking stones with front tires, depending on the blade to protect back tires. Where a grader is not patrolling regularly, occasionally drop the blade on the return trip, to clear the road of sharp stones and spillage.

Maintenance of good scraper blades is vital. Most blades are reversible. A satisfactory hard-surface blade should stand several hundred hours of normal operating; then, if reversible, it still has expended but 50 per cent. of its usefulness.

Be sure in installing or reversing a scraper blade to always put the bevelled side down. If hard-faced, the hard-facing should be up. This causes self-sharpening, which means easier digging and general penetration. Do not let the blade wear back into your scraper's blade base, for this will mean a delay as well as an expensive replacement.

For safety, when making a blade change, be sure to place a block between the apron arm and the top of the scraper's sidesheet. Never take a chance on someone releasing the power control unit brake and letting the apron fall on you. A block should be placed under the bowl, to avoid the chance of the bowl falling and causing someone injury.

Operation is a part of the maintenance of good cable. The best operator works speedily, methodically, and applies his power smoothly, but not so fast that he exceeds the elastic limit of the cable. When cable is reeved true and tight on the power control unit, the operator has gone a long way toward getting the most out of his wire rope. A slack cable will often backlash, causing loose wraps and piling up on the drum.

The operator who jerks a foot of free slack picks up three times the weight of the object he is lifting at the instant the sudden snap hits the rope. This may start a rope failure. Good spooling, common sense operation, and at least monthly inspection of sheave grooves and each sheave itself will mirror profitably on your ledgers.

Both winter and summer care are important to engines of tractors and other prime movers. Military construction has given additional important proof that earthmoving and general heavy machinery will operate practically continuously in sub-zero winter, as well as in extremely high tropical temperatures, if properly cared for.

In winter, perhaps the most important safeguard is control of the cooling system. Be sure now that your tractor is ready for freezing weather. Use a good grade of anti-freeze. Don't wait until the first freeze comes along to put in your anti-freeze. The anti-freeze solution should be tested at the end of each day's performance. Don't forget the cost of anti-freeze is much less than the cost of materials and time spent in replacements.

In summer: (1) Know and never exceed the engine heat operating limits; (2) Keep the radiator air passages clean and unobstructed; (3) See that water pump belts are not slipping; (4) Keep the outside of the engine wiped off. No engine will operate properly under a blanket of lime dust, or other residue.

Generally speaking, slightly heavier greases should be used for scrapers operating in warmer climates, and lighter greases should be employed for operations under colder conditions. Change crankcase, transmission and final drive case lubricants as the seasons change. Watch your starting and lighting batteries, and be sure enough water always exists to withstand freezing weather. Check battery water levels often.

In summer and winter, scrapers as well as all other equipment should be put away clean and protected by a roof or canvas when not in use. Water and mud start corrosion, particularly on parked machinery. Dust finds its way into grease seals, and eventually blocks connections from their tightest possible closings.

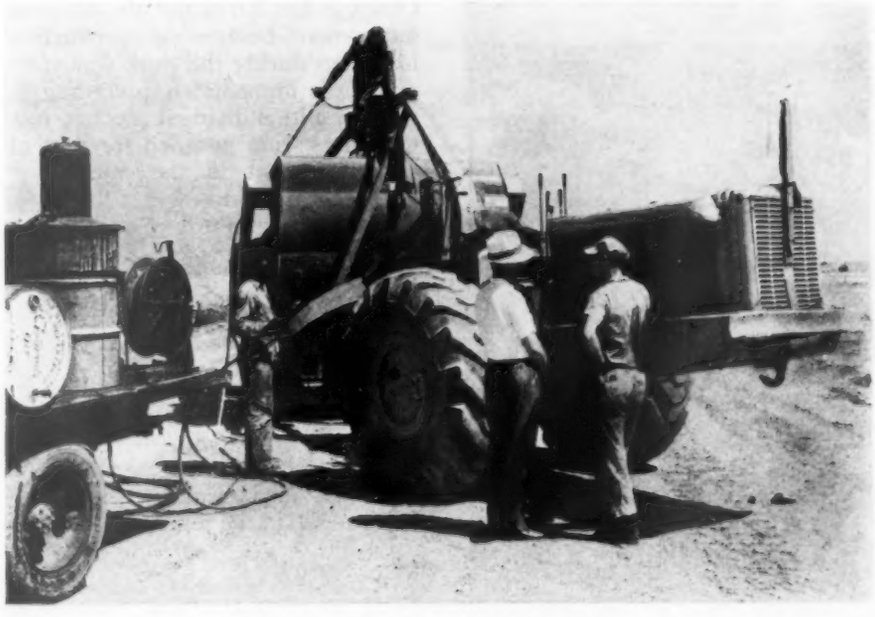
Turning now to small maintenance tips, we remember:

Scraper ground plates wear down. Watch them. When they do, they should be repaired before the scraper sidesheet is damaged. Ground plates can be built up with weld metal. Scraper axles worn where the oil seals bear against the axle can be built up as follows: build up where worn by depositing weld metal or metal spray. Then, re-machine to the correct size. If welding, use a small rod and as little heat as necessary.

Scraper wheels in which the bearing seats have worn over-sized from improper adjustment of the bearing can be salvaged as follows: build up the bores with weld metal or metal spray. Then, re-machine to correct size. Again, if welding, use a small rod and as little heat as possible. Universal forgings that have become worn in the pin holes or where they turn in the bushings may be salvaged this way: build up worn holes and bearing faces with weld metal. Then re-machine to correct size.

Power control unit drum shafts, trunnion bracket spool and cap, power control unit main gears, scraper wheels and other parts may all be submitted to similar emergency repairs until replacements are again readily available.

An example of full loading at a C.A.A. airport near Troy, Alabama.



Scraper being lubricated on the job with portable equipment.

Pioneer Talc Producer Shifting From Direct Water Power to Electricity

Left: Dam and water-power station which operates compressor for one plant and one mine, and mine hoist with cables crossing river. Right: Part of Plant No. 6, the largest operated by the company.

another ON THE SPOT report

ONE of the oldest nonmetallic-mineral producers in this country is the International Talc Company of Gouverneur, N. Y., said also to be the largest producer of fibrous talc in the world. As the International Pulp Company (pulp is the trade term for talc used in paper manufacture) it was formed in 1893 by the consolidation of several smaller companies. The present name was adopted in 1944. Three mines and three mills are now being operated. This company is one of the main reasons why New York produces about 40 per cent. of the United States output and why this country produces about 40 per cent. of world output.

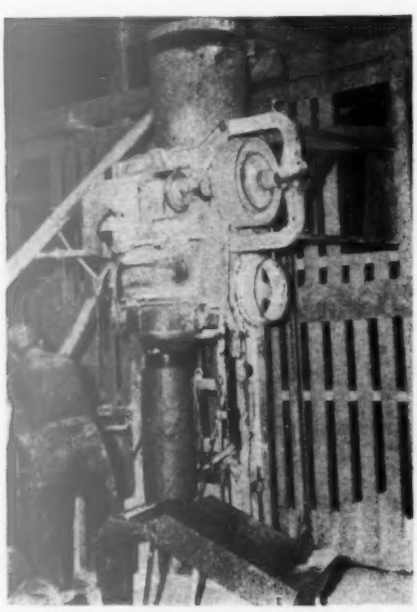
The company's name was changed after years of decline in the demand for talc for use in paper manufacture which many years ago was the chief outlet. Improved methods for removing the grit from talc, however, may result in the recapture of much of this business. The paint industry now is the biggest user of talc, followed by ceramics, rubber, roofing and paper. Next in order come toilet preparations, insecticides, foundry facings, crayons, etc.

By WALTER E. TRAUFFER

Originally all the company's mills were operated by direct water power, among the few such operations remaining in this field. This type of power was economical because of the location of these plants on the Oswegatchie River but the seasonal fluctuation became a production handicap during the peak war years and those immediately preceding it. As a result, individual electric motor drives were installed for part of the equipment in the mines and mills and this conversion will be continued until these operations are completely electrified. This power is supplied by the Oswegatchie Light & Power Company, owned by International, which now operates two hydro-electric power plants. Excess power is now disposed of through Central New York Power & Light Corporation, which also supplies some power in low-water periods.

Other improvements are also being made in the mines and mills to increase the output as the high wartime demand is expected to continue. The three mines known as the Wight, Freeman-Palmer, and Anthony mines are being converted from hand-loading and -tramming to mechanical loading and electric haulage. In the Wight mine which has already been entirely electrified, an Eimco loader is now being used and two others are on order for the other mines. An Ingersoll-Rand scraper is also being used and more will be added. Three electric battery locomotives are now in use—two being new Goodmans.

The Freeman-Palmer and Anthony mines are still operated indirectly through water power. A 475-hp. water wheel near the Freeman-Palmer mine drives a Norwalk 2,700-c.f.m. compressor which supplies air to operate its hoist and is used for all other purposes in all three mines. A generator supplies power for the hoist at the Anthony mine and for other equipment. The compressor is



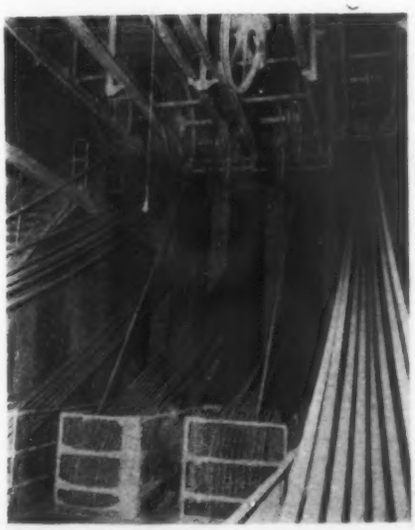
Left: One of 11 belt-driven bag packers in No. 6 plant. Right: Power loader being used in the Wight mine.

Left: One of the electric storage-battery locomotives used in mine shown at battery replacement station. Right: Locomotive with contents of car being dumped to mine skip bucket.

driven through a flat belt 121 feet long and 48 inches wide with 10½-foot drive and 19½-foot diameter driven pulleys.

The company's deposits are a tremolitic talc, consisting mainly of tremolite altered to talc but also containing some primary talc. As a result the material from the company's three mines have nearly identical chemical analyses but there are some differences in their physical structure. They are fissure deposits occurring in dolomite.

Mining is being done by the open-stope method with pillar supports.



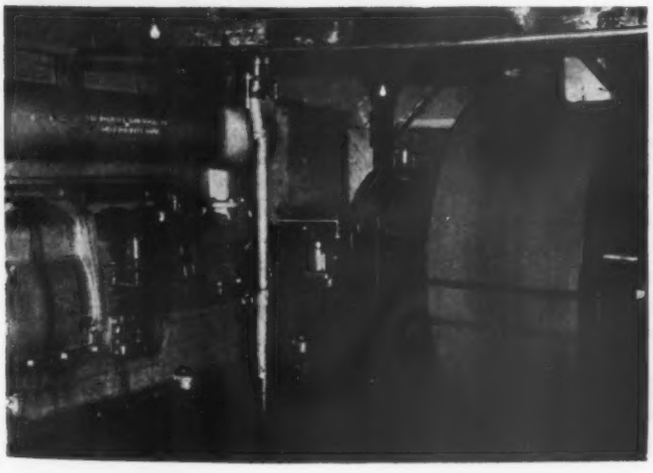
The mines average 450 feet in depth vertically and 600 feet on their inclines which slope about 40 degrees. Selective mining is possible as the nature of the talc varies in different parts of the deposits, depending on the degree of alteration. As buyers specify different densities, colors and finenesses, any desired rough blend can be obtained by selective mining. All blast-hole drilling is now being done with air drills using Timken detachable bits. These are preferred to steel because they save labor. Air hoists are used at two mines to bring the material to the surface, the Freeman-Palmer mine, for example, having a 125-hp. Mead-Morrison hoist. The talc is discharged from the skip cars either direct or through bins into railroad gondola cars for the plant.

A Sullivan Model 12 diamond drill is being used to explore the ore bodies to obtain an estimate of the quantity and quality of reserves. The resulting information will determine the extent of future expansion and modernization programs. This drilling is now done underground but drilling from the surface will also be done. Later this drill will also be used for blast holes.

The average haul from the mines to plants is about 8 miles. There the talc is passed through jaw, cone and roll crushers and revolving screens before going to the mills.

The three mills now being operated, No. 3, 5, and 6, are all lo-

Left: Multiple rope drives from two 700-hp. water wheels in Plant No. 6 to lineshafts. Right: One of 8 mills with belt drive from lineshaft. Below, Left: Compressor at power station with 48-in.-wide drive belt from water wheel. Right: Ore being discharged from mine skip car into railroad car for plant.



Air-operated hoist which runs skip car in one of mines.

cated on the river and each has its own water wheel drive. They now use electricity only on special equipment such as fans, air separators and other recently installed equipment.

The Number 6 mill is the largest, having eight 5- by 24-foot tube mills. Its flow sheet is to be rearranged and fine grinding equipment, dust collectors, air separators and other equipment will be installed to increase its capacity 50 per cent. This mill has two 700-hp. water wheels with long center manila rope drives to line shafts from which the mills and the 11 S. Howes bag packers are driven through flat belts. A Valve Bag packer was recently installed.

The various products are packed in 50-pound, 3-ply paper bags and are usually shipped in carload lots.

The company operates a complete blacksmith and machine shop in which much of the equipment used is made. This includes all the tube mills and all the separators except one Sturtevant machine.

Alvin M. Cummings, a mining engineer, is general manager of the company; R. S. Quinlan is superintendent of all operations.

Southern California Producers Anticipate Record Year in 1946

By HARRY F. UTLEY

PRODUCERS of aggregates in the Los Angeles metropolitan area are entering the first year of peace since Pearl Harbor with a high degree of optimism. California regularly produces more than twice as much sand and gravel as does any other state and the Los Angeles area is the center of production for California, its many plants accounting for about one-third of the state's total output. Sales of sand and gravel by Los Angeles producers are currently running about 600,000 tons per month and by the spring of 1946 are expected to reach the former peak of about 900,000 tons attained in 1942. With an unprecedented demand for housing and other structures in prospect and one of the greatest public-works programs ever launched already under way, the many plants in that area are almost certain to produce and sell a record round million tons in some of the months of this year.

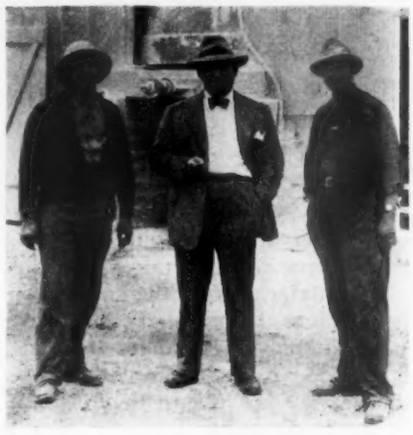
About 90 per cent. of the output comes from two great producing centers—the Roscoe area in the San Fernando Valley to the north of Los Angeles, and the San Gabriel Valley to the east. Until recent years, the San Fernando plants led in output but the trend is now reversed, the greatest tonnage coming from the San Gabriel Valley. Big operators like the Consolidated Rock Products Co., Graham Brothers, Blue Diamond Corp., Arrow Rock Co., and John D. Gregg have producing plants in both areas. All are busy making much-needed replacements of war-worn equipment, putting their production facilities in shape for the anticipated record demand without strain on their facilities.

Early in February the only important new plant under construction, that of the Azusa Rock & Sand Co., is expected to start producing. The new plant will be able to turn out considerably more material than the old plant which has a capacity of about 300 tons per hour and which has been operated by the company for many years. The new Azusa plant will be the last word in modern, fireproof construction as well as efficient, flexible lay-out. The plant structure is all-steel, the bins and machinery bases being of monolithic concrete. A field conveyor in the pit will feed the Allis-Chalmers primary jaw crusher on the floor of the pit. The main conveyor will carry the material to a 30-ft. Link-Belt revolving scalping screen with all further reduction being accomplished by a battery of four 4-ft. Symons short-head cone crushers. Sizing will be done by eight 4- by 14-ft. Allis-Chalmers Ripl-Flo vibrating screens and sand-washing and classification by Stephens-Adamson equipment. All the machinery is new. A 15-compartment truck-loading bin will store the finished materials.

Pump Agstone (*from page* 103)

will probably not be used until regular operations slacken.

In addition to fluxing stone and agstone, the Thomasville Stone & Lime Company also produces glass house stone,[1] fine stone dust, asphalt filler and quick and hydrated lime. Some agstone is produced as a



Left to right: Cal Laughman, quarry superintendent; E. E. Cooke, vice-president and general manager; John Myer, foreman of the agstone plant.

by-product in the operation of the main plant, but the new facilities described here mark the company's first large-scale engagement in the agstone business. The agstone plant was built during 1944, and despite the acute labor shortage only regular

The 6-inch pump which elevates the agstone about 150 feet.

full-time employees were used in the construction work. Production was begun in the late spring of 1945.

Francis Shupp is superintendent of the plant and Ralph Gobrecht is chief chemist.

[1]Limestone is used in the manufacture of glass block as a flux for the silica sand. Some of the large manufacturers use as much as 800 tons of stone per week for this purpose.—Ed.

Thermoid —Key to Progress in Many American Industries

The old method of getting bricks to the bricklayers has been superseded by the modern Thermoid Conveyor Belt

Here's the modern method This Thermoid Belt was chosen because neither weather nor the sharp bricks will injure the belt

SINCE 1880, Thermoid has contributed to the progress of American Industry. In many fields of business Thermoid Products play an indispensable part. For instance, the George Haiss Manufacturing Company, manufacturers of portable conveying equipment, chose Thermoid Conveyor Belting for the portable brick conveyor shown above.

The Thermoid Line* is the result of 65 years of research and experience that not only has kept pace with the demands of industry, but in many cases anticipated industry's needs.

The Thermoid Line* of belting and hose for materials handling and power transmission may contain the key to another step forward in the improvement of your process and the reduction of your costs.—"It's Good Business to Do Business With Thermoid."

***THE THERMOID LINE INCLUDES: Transmission Belting • F.H.P. and Multiple V-Belts and Drives • Conveyor Belting • Elevator Belting • Wrapped and Molded Hose • Sheet Packings • Industrial Brake Linings and Friction Products • Molded Hard Rubber and Plastic Products.**

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Contributor to Industrial Advancement Since 1880

Air-operated hoist which runs skip car in one of mines.

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By HARRY F. UTLEY

PRODUCERS of aggregates in the Los Angeles metropolitan area are entering the first year of peace since Pearl Harbor with a high degree of optimism. California regularly produces more than twice as much sand and gravel as does any other state and the Los Angeles area is the center of production for California, its many plants accounting for about one-third of the state's total output. Sales of sand and gravel by Los Angeles producers are currently running about 600,000 tons per month and by the spring of 1946 are expected to reach the former peak of about 900,000 tons attained in 1942. With an unprecedented demand for housing and other structures in prospect and one of the greatest public-works programs ever launched already under way, the many plants in that area are almost certain to produce and sell a record round million tons in some of the months of this year.

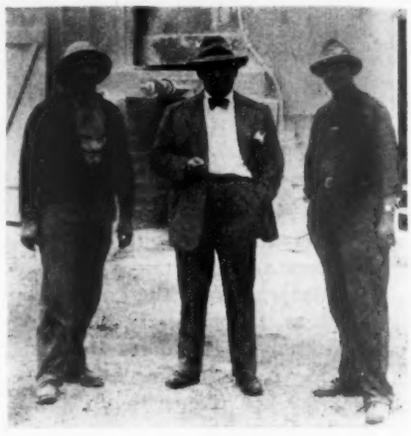
About 90 per cent. of the output comes from two great producing centers—the Roscoe area in the San Fernando Valley to the north of Los Angeles, and the San Gabriel Valley to the east. Until recent years, the San Fernando plants led in output but the trend is now reversed, the greatest tonnage coming from the San Gabriel Valley. Big operators like the Consolidated Rock Products Co., Graham Brothers, Blue Diamond Corp., Arrow Rock Co., and John D. Gregg have producing plants in both areas. All are busy making much-needed replacements of war-worn equipment, putting their production facilities in shape for the anticipated record demand without strain on their facilities.

Early in February the only important new plant under construction, that of the Azusa Rock & Sand Co., is expected to start producing. The new plant will be able to turn out considerably more material than the old plant which has a capacity of about 300 tons per hour and which has been operated by the company for many years. The new Azusa plant will be the last word in modern, fireproof construction as well as efficient, flexible lay-out. The plant structure is all-steel, the bins and machinery bases being of monolithic concrete. A field conveyor in the pit will feed the Allis-Chalmers primary jaw crusher on the floor of the pit. The main conveyor will carry the material to a 30-ft. Link-Belt revolving scalping screen with all further reduction being accomplished by a battery of four 4-ft. Symons short-head cone crushers. Sizing will be done by eight 4- by 14-ft. Allis-Chalmers Ripl-Flo vibrating screens and sand-washing and classification by Stephens-Adamson equipment. All the machinery is new. A 15-compartment truck-loading bin will store the finished materials.

Pump Agstone (*from page* 103)

will probably not be used until regular operations slacken.

In addition to fluxing stone and agstone, the Thomasville Stone & Lime Company also produces glass house stone,[1] fine stone dust, asphalt filler and quick and hydrated lime. Some agstone is produced as a by-product in the operation of the main plant, but the new facilities described here mark the company's first large-scale engagement in the agstone business. The agstone plant was built during 1944, and despite the acute labor shortage only regular full-time employees were used in the construction work. Production was begun in the late spring of 1945.



Left to right: Cal Laughman, quarry superintendent; E. E. Cooke, vice-president and general manager; John Myer, foreman of the agstone plant.

The 6-inch pump which elevates the agstone about 150 feet.

Francis Shupp is superintendent of the plant and Ralph Gobrecht is chief chemist.

[1]Limestone is used in the manufacture of glass block as a flux for the silica sand. Some of the large manufacturers use as much as 800 tons of stone per week for this purpose.—Ed.

Thermoid —Key to Progress in Many American Industries

The old method of getting bricks to the bricklayers has been superseded by the modern Thermoid Conveyor Belt

Here's the modern method This Thermoid Belt was chosen because neither weather nor the sharp bricks will injure the belt

SINCE 1880, Thermoid has contributed to the progress of American Industry. In many fields of business Thermoid Products play an indispensable part. For instance, the George Haiss Manufacturing Company, manufacturers of portable conveying equipment, chose Thermoid Conveyor Belting for the portable brick conveyor shown above.

The Thermoid Line* is the result of 65 years of research and experience that not only has kept pace with the demands of industry, but in many cases anticipated industry's needs.

The Thermoid Line* of belting and hose for materials handling and power transmission may contain the key to another step forward in the improvement of your process and the reduction of your costs.—"It's Good Business to Do Business With Thermoid."

***THE THERMOID LINE INCLUDES: Transmission Belting • F.H.P. and Multiple V-Belts and Drives • Conveyor Belting • Elevator Belting • Wrapped and Molded Hose • Sheet Packings • Industrial Brake Linings and Friction Products • Molded Hard Rubber and Plastic Products.**

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THE LIME PLANT OPERATOR

BY WOLF G. BAUER

THE LIME KILN—CONSIDER ITS JOB

another P&Q exclusive

IT IS probably anything but discretion that has led the writer to attempt discussions on lime kilns, as one cannot at times be anything but critical in treating this subject in a manner helpful and revealing to the operator. Instead of titling this opening kiln article "The lime kiln—consider its job," the writer is tempted to justify his literary efforts by the heading "'The turtle — consider its philosophy; it only makes progress when it sticks its neck out."

There is obviously little professional pride or satisfaction in criticising current equipment and practices. It is not so much lack of engineering talent and knowledge that is holding back higher development in our specialized equipment needs, as it is lack of an industry-wide and industry-sponsored improvement program, furnishing facilities to research institutions and colleges to evolve new, modern and low-cost calcination equipment and processes for the industry. What the petroleum industry, for example, has accomplished during the war by pooling brains and know-how, other industries like ours could do likewise; such concerted action reflecting in better quality lime to the consumer, and wider profit margins to the operator. However, this is getting off our subject.

The kiln is generally the heart of the plant, the center of operation. However, as such it is usually chronically ailing, even though lime seems to be made despite its condition. That is an eternal wonder as long as we do not look too closely at costs and lime quality. But whether that kiln is a smooth, continuous, automatically operated and controlled calcination machine, or whether it is a heap of limestone piled against a clay bank with a fire tunnel in its bottom,— in each case hot flames and gases are made to sweep against the broken stone particles in a more or less efficient and controlled manner. The science of lime burning centers very much about this little matter of "more or less." By "efficient" we refer to optimum heat and labor utilization. By "controlled," we understand absolute command of burning time, temperature, and heat distribution. Mastering efficiency and control is mastering economics and quality. The engineer thinks in terms of the former, the operator in terms of the latter. In their effects they are one and the same.

Types of Kilns The lime-burning equipment used today in all parts of the globe is more varied than one might be led to believe from the fact that only various forms of vertical shaft and rotary kilns are employed. Let us realize that it is not the rotary shell or the upright shaft alone that classifies the calcining device, but rather the arrangement of design features which bring about the contact of heat and stone that differentiates such burning equipment. We are beginning to notice at present some very definite signs that changes in design and techniques of burning are in the air. The nature of these changes is an outcome of several factors, of which kiln capacity, fuel efficiency, new fuel application, lower and better-controlled temperatures, the utilization of smaller sizes of stone, higher degree of mechanization and automatic control, lower investment cost per ton of lime, and greater operational economy are the motivating reasons behind design changes.

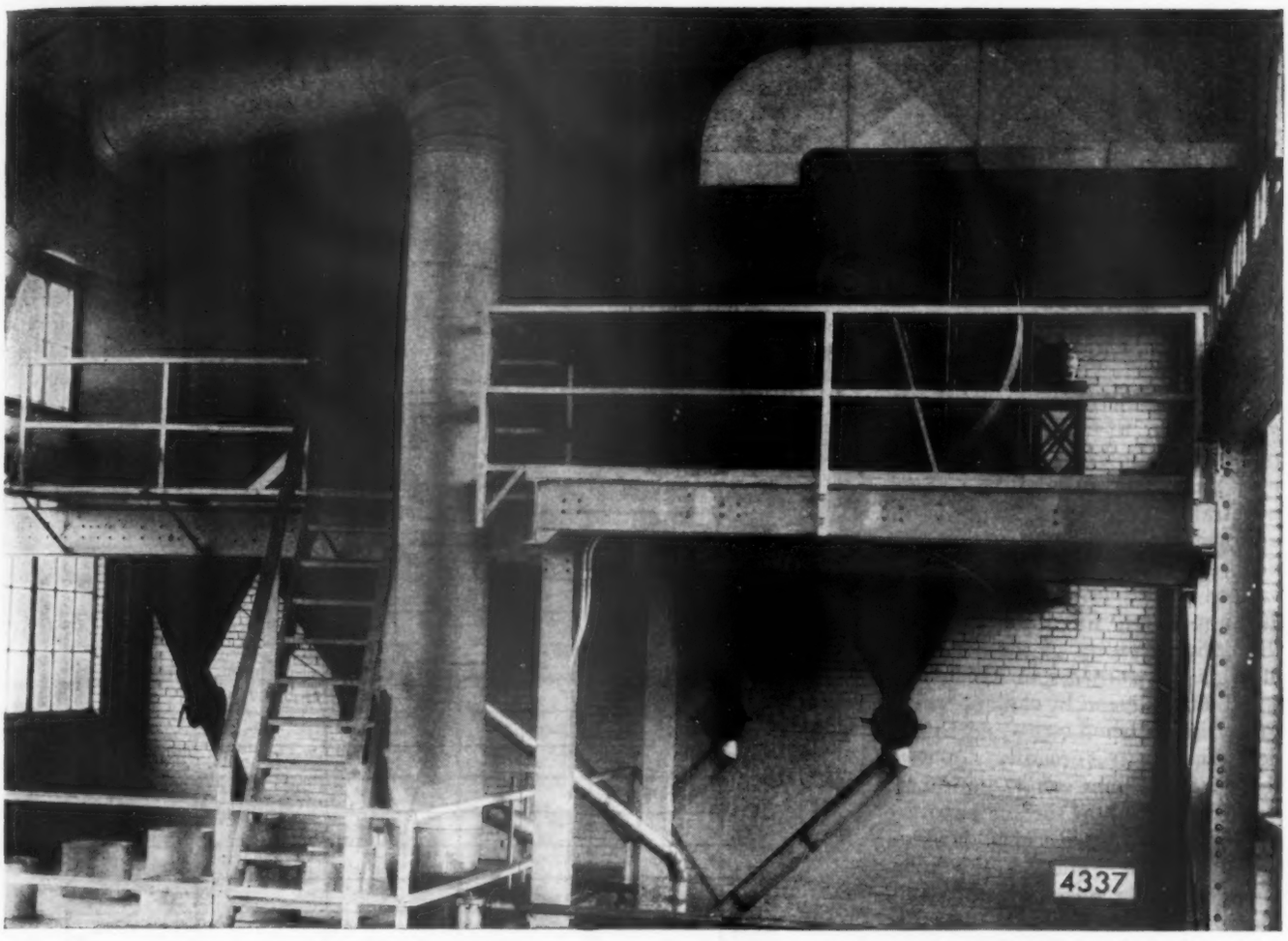
Before we step on lime kiln designers' toes (including our own) and discuss the many kilns, burning techniques, and operational faults and merits of prevalent installations, let's analyze some of the factors that influence design and operation, and find out to some degree just what might be the limits and obstacles that must be considered and surmounted.

HEAT APPLICATION

To bring heat to the stone is our primary object. This we accomplish by burning combustible matter in close proximity of stone and lime. But the manner in which we cause the so-generated heat to be transferred to the material, that is where the great differences of design, operational technique, and engineering opinions occur. In order to approach these problems in a rational manner, we ought to consider some of the theoretical as well as the practical factors. The former include the maximum transfer of heat by both radiation and convection, as well as the recovery of all possible heat from the hot gases or solids for useful purposes. The practical factors involve chiefly problems of accomplishing this with maximum control and minimum cost.

Heat Generation The generation of heat from fuel is a chemical exothermic reaction that takes place at a high rate of speed. During this process, in which carbon and the various hydrocarbon combustibles combine with the oxygen of the air to form carbon dioxide, carbon monoxide, and water, a certain quantity of heat energy is released. The temperature or intensity of this heat is a measure of the rapidity of this reaction, which in turn is a function of the concentration of carbon and hydrogen molecules, the sensible heat already in the combustible and air, and the degree of turbulent intermixing of these reacting molecules of carbon, hydrogen, and oxygen during the instant of combustion, and in the immediate zone thereof.

Heat Radiation Depending on the temperature or molecular energy intensity, the heat so generated dissipates itself in part as radiant wave energy in all directions. These waves are intercepted and absorbed and reflected by the material in their path at a rate depending on the particular substance receiving them, and the difference in temperature between the source and the receiving body. Only



Sly Dust Filters—heart of the Complete Sly Dust Control System—at Oliver United Filters, Inc., Hazelton, Pa.

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This efficient dust control system collects even the very fine dust which, if uncontrolled, works its way into bearings and other moving parts of machinery, and settles widely over plant and neighborhood . . . the fine dust which also enters the human respiratory system.

While these are important savings, even larger ones are effected by the recovery of valuable materials, notably in the cement industry. In this field Sly Collectors have done such an outstanding job that they outnumber by far any other make.

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Sly Dust Collectors are different—they get all the dust by filtration through cloth. Over 5,000 installations.

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1. **Greater filtering capacity because of more filtering cloth.**
2. **Taut bags (patented) save power and improve dust removal.**
3. **Bags more easily replaced.**
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part of this radiant energy is actually absorbed by material surrounding the combustion zone, as a portion is reflected from the absorbing surfaces. Such reflection depends on the particular substance, and on the physical nature of its surface. It is obvious that there is a considerable back-and-forth emission and reflection, as well as reabsorption of heat rays among and between adjacent surfaces from bodies of high-intensity heat to those of lower energy level. It is also apparent that this heat energy originally emanates in the form of spherical planes from myriads of source centers, much like sound waves. Such penetration of radiant energy is not uniform because of obstructing particles and unequal absorption in the various directions. All these points are important, for they determine the design features of those sections of kilns and furnaces in which heat is to be transferred by radiant waves. From this rather sketchy and simplified picture it is readily apparent that if we depend on radiant heat transfer, maximum surface exposure with minimum interference of material is desirable. There is also interference due to dust suspensions in the gases, to unburned solids as in powdered coal, and in the dense packing of the absorbing material itself.

For reasons of general interest, it might be pointed out that the amount of heat radiated from a body is proportional to the 4th power of the absolute temperature. The net radiant transfer between two bodies or a flame and a solid is proportional to the difference between the 4th powers of the respective absolute temperatures. This is commonly known as the Stefan-Boltzmann law, and is stated as follows: $Q = 0.173 \times 10^{-8} AT^4 e$, where Q is radiant heat emitted in B.t.u. per hour, A is the area of the body in sq. ft., T is the absolute temperature in degrees F., and e is the emissivity of the particular substance, which is somewhere near 0.9 for lime and brick at 2000 deg. F.

Sensible Heat Aside from radiant heat, which may be called high-temperature or visible heat, the heat imparted the gases from combustion is carried along by them as sensible heat. This heat must be transferred by contact with the surfaces of material which is at a lower temperature than the contacting gases. The resistance to this heat exchange between the gases and solids lies in the minute, stagnant gas films at the surface of the solid material. As the thickness of these films decreases, with an increase in velocity of the contacting gases, it is particularly desirable to maintain highly turbulent gas flow conditions. C. C. Furnas of the U. S. Bureau of Mines has determined that heat transfer due to forced convection through a bed of broken solids varies as the 0.7 power of gas velocity (cu. ft. cold gas per sq. ft. of bed area), as the 0.3 power of the absolute temperature, and inversely as the 0.9 power of particle diameter.

Calcination In considering the heat transfer between gases and solids, it would seem obvious that after the heat is imparted to the surface layer of the solid particles by either radiation, convection or both, this heat must travel to the center of the piece by conduction. The rate of such heat absorption depends on the particular conductivity of the substance. When the surface temperature of a piece of limestone reaches that of dissociation, the heat absorption is materially increased due to the demands of not only heating the inside, but also of driving off the CO_2 molecules.

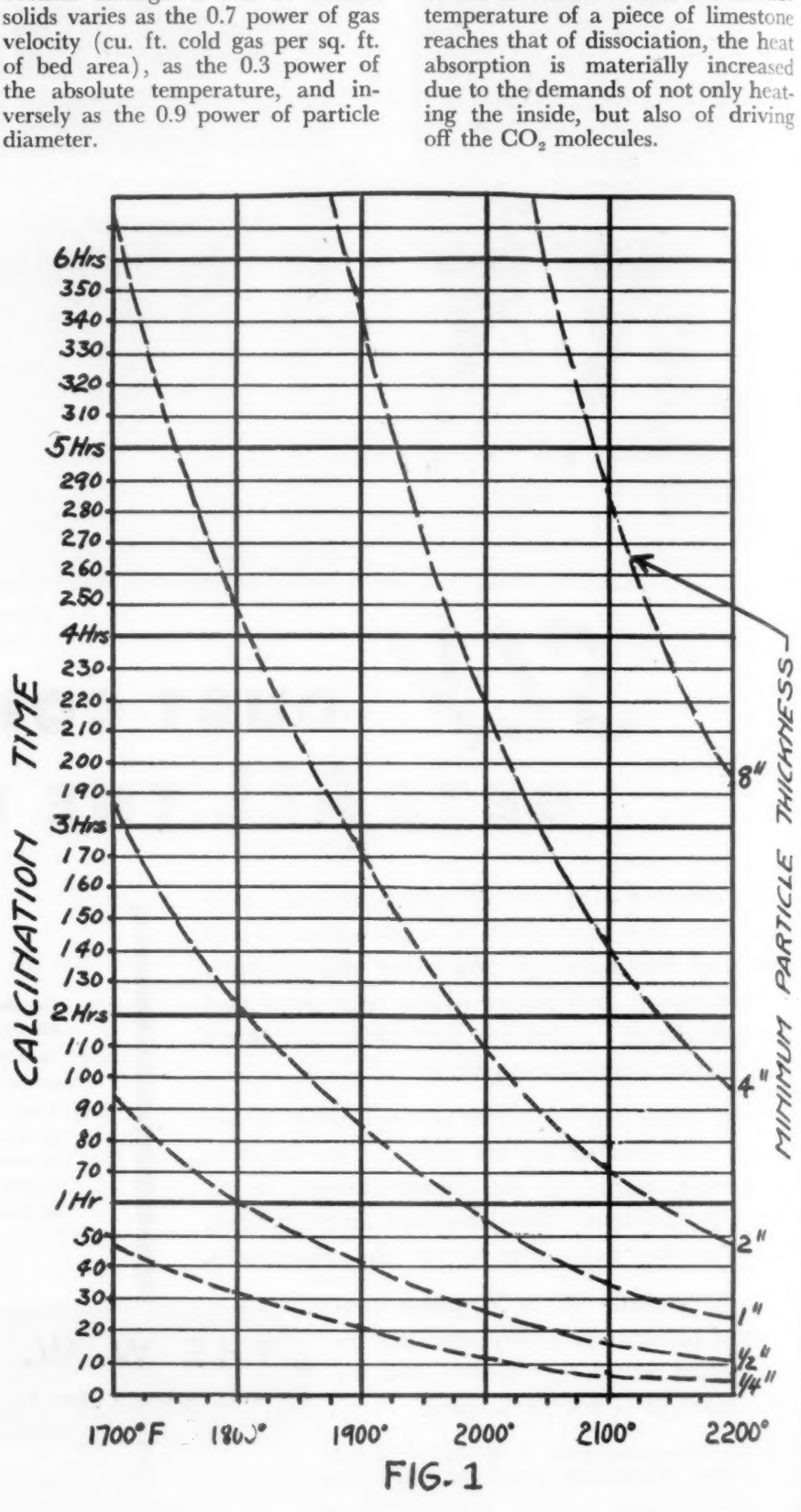


FIG. 1

We may picture calcination to progress from the surface to the center along planes which are approximately equidistant from the surface. These "isothermal" planes form the boundary or interface between carbonate and oxide, and this boundary advances at a constant linear rate which is a function of the temperature. In other words, if limestone is burned at a higher temperature, it will take less time to burn out its core. Fig. 1 shows the plotted relationship between stone size, temperature, and calcination time, as plotted from data published by Furnas and re-arranged to give several curves for some typical particle sizes between ¼ and 8 inches.

Kiln Comparisons With such facts noted, let us now analyze and compare present day calcination systems and equipment, and find out what is holding back high efficiencies, and just what is the nature of practical difficulties that confront the designer. In other words, what have been the obstacles in the way of designing a universal calcination apparatus that combines the advantages of all present calcining equipment, and which is in line with the general trends in the industry?

We should first fix certain facts in our mind. The trends are definite, and arise from needs readily recognized. They can be classified under A—Stone and lime size; B—Equipment size and cost; C—Operating cost; and D—Quality control.

A—1. There has been a distinct trend in utilization of smaller sizes of stone and lime during the past years. Mechanization in mining, quarrying, and handling has been an influencing factor.

2. The chemical process consumer, with the possible exception of some open-hearth furnace operators, prefer smaller and closer-screened sizes of lime.

B—Equipment size is relative. A lime plant of 750 tons' daily capacity might have three calcining units of 250 tons' capacity each per day, whereas a plant of 200 tons' daily capacity would, on the basis of similar flexibility, have three small units each of 70 tons' daily capacity. It is obvious that three 70-ton rotaries are more of an investment than one 210-ton unit. When we consider modern shaft kilns of high capacity, such output is limited to less than 100 tons per day per kiln, so that a 750-ton plant would require about nine such units. This would not show a great saving in cost over three rotaries, considering the multiplicity of kiln and fuel operations in the case of the shaft kilns. On the other hand, three units would show a lower first cost for the 200-ton plant when such kilns are high-capacity vertical kilns over any rotary kiln installation, and at a lower operating cost of combined fuel and labor charges. It is apparent, therefore, that the plant size alone can easily become the criterion on which the choice of kilns might depend. The whole picture, however, is considerably modified by the type of fuel-burning installation that is part of the kiln arrangement.

C—Operating cost resolves itself chiefly into labor, fuel, power, depreciation, and maintenance of the unit. Here the dividing line between efficient vertical and rotary operation depends a good deal on the plant size.

1. Labor favors the rotary kiln simply because an increase in output generally entails installing a larger unit which can be operated with no increase in labor; whereas an increase in output from a shaft kiln plant usually entails multiplicity of kiln and fuel units, thereby increasing labor attendance.
2. Fuel costs are usually lower for shaft kilns because of inherent higher-heat-recovery possibilities. However, beyond a certain plant capacity, labor and fuel equipment costs become higher, and will eventually offset savings due to kiln efficiencies. The easier adaptation of burning equipment to cheaper fuels, in the case of rotaries, partly offsets vertical kiln efficiency.
3. Comparative power costs show no great divergence, whereas maintenance and depreciation favor the shaft kiln below a certain plant capacity.

D—Quality control is far from satisfactory, and has not been mastered to a nicety in either type burning operation. The process continuity of rotary kiln operation has, up to now, favored automatic control application in such plants, but there are too many variables yet on the loose.

With these brief comparisons sketched, we recognize that the choice of kiln depends not only on the size of plant, but also on the degree of stone-size utilization, and available fuels. In succeeding issues we shall come to grips with the burning systems and equipment itself, indicating how far we have advanced at present, and from what direction the next logical development might be expected.

Variables The problem is not how many B.t.u. are needed, but how they might be best applied and controlled. We have made many improvements, but we have also sidestepped main issues in both rotary and shaft-type kilns. As pointed out earlier, heat-generating gases pass from a high- to an intermediate- and to a low-temperature stage in their passage through any kiln. We also indicated that heat transfer is chiefly by radiation in the high-temperature stage, and that this transfer rate increases with the temperature and the temperature difference between the gas and solids. For a certain mass of solids the quantity of radiant heat exchanged depends on the heat-absorbing surface exposed to the radiant source of energy. On the other hand, when gases are below radiant heat emission, heat flow depends on gas friction around the solid particles, and this is a function of gas velocity. The quantity of this latter heat transfer depends on the solid surface in the path of the scrubbing gases, and the temperature differences. It is quite apparent, therefore, that these prime requirements should be considered if we are to have efficient heat flow between the gases and the lime and stone particles. How well or how poorly these requirements are satisfied in present day burning equipment is a subject for discussion in the next issue.

Safety Council Calendar

In line with the 1946 slogan of the National Safety Council, "Safety begins at home", the council's calendar for this year is illustrated with 12 full-color reproductions of paintings of famous American homes. The organization will conduct a monthly safety limerick contest throughout the year, offering a $25 award for the best rhyming "last line" each month.

Portable aggregate plants are here to stay. If you are interested, the Pit and Quarry Handbook will tell you all about them.

PERSONAL MENTION

JAMES G. VAIL, former vice-president of the Philadelphia Quartz Company, was recently elected president of the firm. C. M. A. STINE, vice-president and director of E. I. du Pont de Nemours & Company, has been named vice-president of the Philadelphia concern.

Charles Warner

CHARLES WARNER, president of the Warner Company of Philadelphia and former National Lime Association president, was named by the Construction Industry Advisory Council a member of the liaison committee appointed to work with the Government in stimulating post-war construction. The council was formed at a meeting at the United States Chamber of Commerce in Washington, D. C., attended by 235 representatives of the construction industry.

COMDR. GEORGE W. MOYERS, U.S.N.R., recently released from the Navy, will resume his former duties as sales manager of the International Minerals & Chemical Corporation's Phosphate Division. He will have charge of domestic and foreign sales.

Norman T. Almquist

NORMAN T. ALMQUIST, who was affiliated with the American Road Builders' Association from February, 1937, to January, 1942, has been discharged from the Seabees and has returned to the association as administrative assistant.

In his four years with the armed forces Mr. Almquist saw considerable service in the Central Pacific and the Philippines with the 127th Naval Construction Battalion.

F. S. NORCROSS, JR., president and general manager of the Freeport Sulphur Company's manganese mining subsidiary in Cuba, has been named a vice-president of the company. In his new office Mr. Norcross will take part in Freeport's proposed expansion activities.

DONALD SCHULTZ, former mine foreman at the National Gypsum Company's Akron plant, was recently named assistant superintendent of the Clarence Center mine. He was transferred to the latter location after the Akron plant had won the safety contest awarded annually by the EXPLOSIVES ENGINEER, largely through his efforts.

SIR P. MALCOLM STEWARD, chairman of Associated Portland Cement Manufacturers, Ltd., and of the British Portland Cement Manufacturers, Ltd., announced his resignation from these offices. He will be succeeded in both posts by George F. Earle, who has been managing director of the organizations since 1937. Sir Malcolm, who has headed the enterprises for the past 21 years, was appointed president and advisory director to the boards of both.

OSCAR H. D. ROHWER, vice-president of the Universal Atlas Cement Company, retired from this position on December 31. Mr. Rohwer had been with

Oscar Rohwer

H. W. Dieckmann

the firm since 1907, except for a two-year interval. He had progressed from salesman, special representative, division sales manager, and assistant general sales manager to vice-president. He will be succeeded by FRED T. WIGGINS, assistant to the vice-president, New York, who now becomes vice-president of the western region at Chicago.

Among other Universal staff members retiring at the same time are the following:

WILLIAM A. MCINTYRE, sales manager at Philadelphia, after a 28-year term of service; successor, R. E. FULTON.

FRANK E. GUY, general traffic manager, who has a record of 39 years with the company; successor, L. W. CARRIER.

FINDLAY S. DOUGLAS, assistant to the president, after 37 years with Universal.

ARTHUR W. HEYMAN, combustion engineer and co-developer of Atlas White and Atlas Lumnite cements, an employee for more than 40 years.

DANIEL I. ELDER, research consultant, who has 20 years of service to his credit.

LEWIS G. SPRAGUE, chief chemist and inspector at Northampton, Pennsylvania, who leaves Universal after more than 30 years of service; successor, H. W. DIECKMANN.

F. E. WOMER, auditor at Northampton, after 34 years with the company; successor, A. R. WESTIN.

PURD B. WRIGHT, JR., ERNST GRUENWALD and JAMES F. CALLERY are newly-promoted members of the Lone Star Cement Corporation staff. Mr. Wright is now manager of "Incor" and technical service; Mr. Gruenwald has become chief engineer of technical service; and Mr. Callery is manager of the publicity department.

L. M. Funderburg

LOUIS M. FUNDERBURG, general operating manager of the Universal Atlas Cement Company, United States Steel Corporation Subsidiary, has been elected vice-president, effective January 1, in general charge of manufacturing operations. Mr. Funderburg has been with the company for twenty-two years.

Starting as a draftsman at the Leeds, Ala., plant in 1923, he became assistant engineer and then progressed by various steps to plant superintendent, which position he held from 1936 to 1942. In the latter year he became operating manager and subsequently general operating manager.

Mr. Funderburg received his technical education at Alabama Polytechnic Institute. Prior to his cement connection, he served in the Army in World War II and then became plant engineer for the Alabama By-Products Corporation at Tarrant, Alabama. Mr. Funderburg is a member of the American Institute of Mining and Metallurgical Engineers.

Col. Henry Crown

COLONEL HENRY CROWN, whose recent retirement from active service in the U. S. Army Engineers Corps was mentioned in an earlier issue, was presented with the Legion of Merit by Lieutenant General R. A. Wheeler in Washington, D. C., last December.

Colonel Crown, now chairman of the board of directors of the Material Service Corporation in Chicago, received the medal and citation in recognition of his distinguished service as chief of military supply, U. S. Corps of Engineers.

OBITUARY

WILEY B. THIGPEN, JR., 62, vice-president and sales manager of the American Sand & Gravel Company of Hattiesburg, Mississippi, died on November 23 at his home.

Charles F. Conn

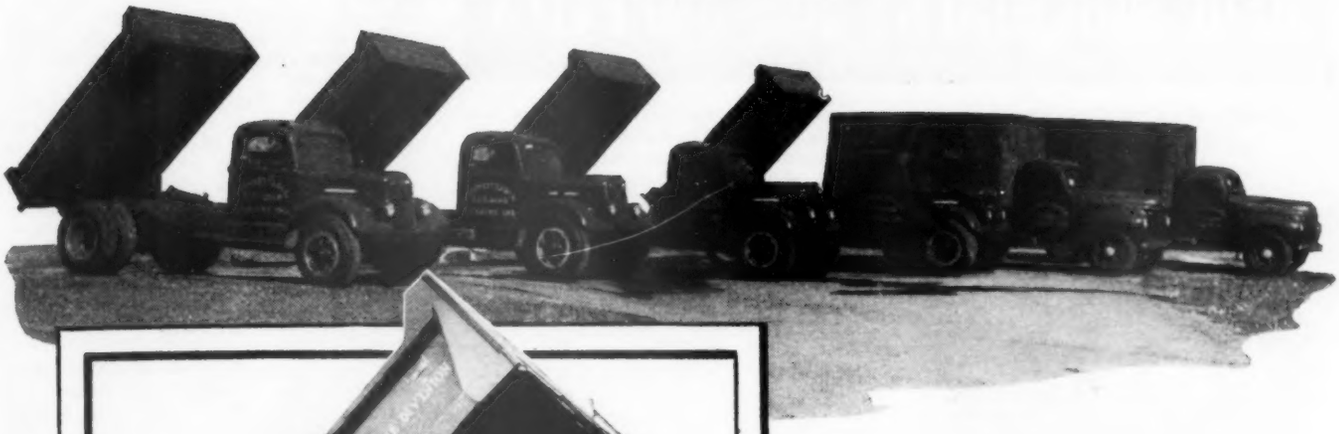
CHARLES F. CONN, 80, who served 37 years as president of the Giant Portland Cement Company, Philadelphia, died on December 28 after a brief illness at his home in Wayne, Pennsylvania. He retired as president of the firm two years ago and at his death was chairman of the board of directors.

In earlier years, Mr. Conn was associated with the administrative offices of the New York, New Haven & Hartford Railroad.

A. O. WALKER, vice-president and general manager of the Muskogee Materials Company of Muskogee, Oklahoma, was killed in an explosion which also took the lives of three other persons. Mr. and Mrs. Walker and Mr. and Mrs. R. J. Smith had stopped on the night of August 25 to inspect a house which the Walkers planned to occupy later. One of the party struck a match to locate a light switch, and an explosion of odorless butane gas followed.

ALBERT E. O'NEIL, 57, who was for 27 years secretary-treasurer of the Aetna Portland Cement Company of Bay City, Michigan, died on December 3 at his home in Grosse Pointe Park, Michigan.

NO BED OF ROSES



Hercules WD-12 heavy duty dump body, with pyramid type steel side braces and heavy boxed corners. This unit, of four cubic yard capacity, is equipped with a Hercules 8X Hoist.

There's a long, rugged life ahead of these new Hercules units . . . long hours and punishing service under the most difficult operating conditions. That's what railroad construction and maintenance of way work means . . . constant, driving work, day after day, with every job marked "Rush". But these heavy duty bodies and hoists will measure up to the task because each unit is designed and built for the toughest kind of service. All the jobs, under any conditions, will be finished on time and right.-

Whether your haulage work is as difficult as this or not, it's nice to know that your equipment, built by Hercules, will deliver a full measure of satisfactory, low-cost service every day. Whatever your haulage problem, there's a Hercules unit built to help you get the work done in less time and at lower cost. Write today for complete information.

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DUMP BODIES AND HYDRAULIC HOISTS
SPLIT SHAFT POWER TAKE-OFFS • COAL CONVEYORS

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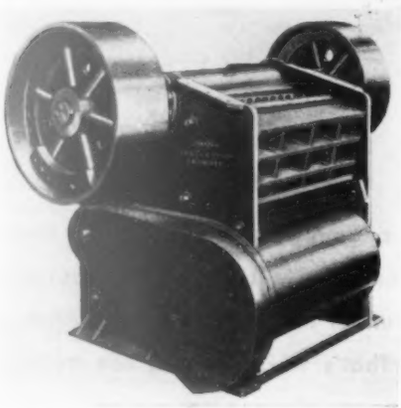
Center-Lift Hoist • Reversible Tailgate Hardware • Piston-Type Control Valve Hoist Mounts Above Frame • Easy-Reach Tailgate Lever • Accessible Hoist Cylinder Dash Controls for Hoist and Take-Off Patented Tire and Tool Pack

HERCULES STEEL PRODUCTS COMPANY . . . GALION, OHIO

NEW MACHINERY and SUPPLIES

● Double Action Crusher

A new "Dual-Action" crusher, combining jaw and roll operation in one small unit, is offered by the Diamond Iron Works, Inc., of Minneapolis, Minnesota. Of all-welded construction and



Jaw and roll operation in one unit.

with heavy, double-chain drives, this unit is said to have low power consumption because of the extreme leverage. Due to the correlated shape and action of the roll and lower jaw, the crusher reportedly produces a minimum of slivers and oversize, normally not over 5 to 7 per cent., with no packing, and a product that is crushed to size and of rectangular shape. Surface speed of roll and jaw at the concave area are synchronized through a counter-shaft drive to travel together at a relative, predetermined speed. A lever on the side is accessible for the operation of a new type double-wedged toggle adjustment.

● Convertible Crane

A new rubber-mounted mobile crane unit, embodying power shovel, trench-hoe, dragline and clamshell, is now in production at the American Steel Dredge

Rubber-mounted mobile crane.

Company, Inc., of Fort Wayne, Indiana. The unit will be known as "Wayne Crane" and is available as a crane or complete with accessory groups for converting to other adaptations. The independent or simultaneous operation of boom, shovel, trench-hoe or propulsion mechanism and the self-leveling chassis are major features. The full-vision cab uses no center-pin, as it revolves on a 48-inch ball-race outside the swing-gear. A 62-horsepower gasoline engine drives all four wheels and the hoisting mechanism. The Wayne Crane, which has a 7-foot, 8-inch wheelbase and four travel speeds up to 15 miles per hour, is said to comply with all highway regulations. For earth-moving applications, the unit has a ½-cubic-yard capacity, and as a crane it has a 4-ton capacity at a 10-foot radius. A 30-foot boom is used for crane, clamshell and dragline operations, and a 15-foot boom is employed on the shovel and trench-hoe.

● Heavy-Duty Truck

The Ward LaFrance Truck Division, Elmira, New York, a division of Great American Industries, Inc., is offering its new series D line of trucks with gross vehicle weights ranging from 25,000 to 35,000 pounds. Wheelbase lengths from 149 to 220 inches are available for tractor or single unit service, with a selection of two basic frame sizes. Both

Gross weights to 17½ tons.

frames are of heat-treated chrome manganese steel and are reported to have a yield strength of 85,000 pounds. Except for the D-5, which uses the largest chassis and a Cummins HB 600 diesel engine, all models are powered by Continental gasoline engines ranging in sizes from 427- to 602-cubic-inch displacement; models D-2, D-3, and D-4 employ the R series Continental motor. Timken axles are used throughout, with spiral bevel axles on the two lightest models and double reduction type on the remainder. The drive on all models is by a radius rod which is linked up to the chassis through a universal-type ball socket. Standard equipment calls for Bendix-Westinghouse air brakes.

● Cement Cooler

Two new products are announced by the Northern Blower Company, Cleveland, Ohio. The "Norblo" cement cooler is an application of the dust collection principle to the air cooling of cement during the grinding process. With clinker entering the grinding mills at 350 degrees, or raised to that temperature by the grinding itself, the finished cement entering the pump is claimed to be brought down to 200 degrees or lower. According to the manufacturer, the cooler can be added, with special attachments, to existing air separators to bring the temperature of fines down to any desired degree, while at the same time reducing the temperature of tailings being returned to the mills. This is said to prevent the grinding process from building up its internal temperatures.

The other Norblo product is a new type of axial-flow centrifugal dust collector. This type of collector is said to be compact, easier to locate and economical. It can be placed directly into any straight line of piping without alterations, and as all air has parallel flow, there are no turns or elbows and no change of direction of air flow.

● Hydraulic Cradle

A new hydraulic cradle truck for portable conveyors has been developed and introduced by the Pioneer Engineering Works, Minneapolis, Minnesota. De-

Hydraulic cradle truck for conveyors.

veloped for use in the pit, mine, and quarry industries, this new truck can be raised or lowered by one man at the lever of a simple hydraulic pump, actuated by finger-tip control. In the lowered position, the truck requires little headroom, and portability is improved.

● Third-axle Assembly

A dual-wheeled third-axle assembly, which can be installed on any truck chassis under 26 feet in length, is produced by the Truck Equipment Company, Inc., of Buffalo, New York. Gravity springs, heavy frame brackets, and spring-leaf cross member are said to be the "heart" of "Truxmore," the trade

Dual-wheeled third-axle truck assembly.

name of this device. A sliding-ball joint is claimed to permit any one wheel to take 14-inch bumps or holes without lifting the other tires off the ground, or shifting the weight from one axle to the other. The Truxmore is attached to the chassis behind the permanent rear axle. Lateral shock is taken up through a hanger suspension on the rear of the main spring, while transverse shock is accommodated by the sliding-ball joint.

Tailor-Made
FOR HANDLING AGGREGATES

The HANDLING OF ROCK, gravel, sand and aggregates demands faultless construction in a conveyor belt. The constant beating it takes and the cutting and abrasive action of materials, call for special built-in qualities. Each Republic belt—Super-Excelo Reprene, Record Maker-S and Chariot-S—is virtually "tailor-made" for a specific use. Service requirements are studied by Republic technologists before specification of rubber and reinforcing components. Then expert belt-builders construct the belt with utmost care and skill. The "tailor-made" values of Republic conveyor belts are known in the stone products industry by outstanding belt performance. Consult your nearby Republic Distributor.

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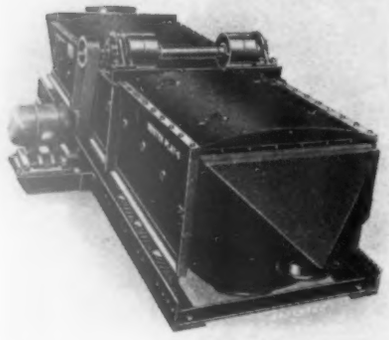
● Vibrating Screen

The "Plat-O" elliptical throw vibrating screen is a product of the Deister Machine Company of Fort Wayne, Indiana. At the beginning of the operation, the screen is almost horizontal, and the extreme fines are said to pass through quickly while the remaining material is pushed along by the elliptical throw, the large oversize being thrown or bounced off the screen at the bottom. This is



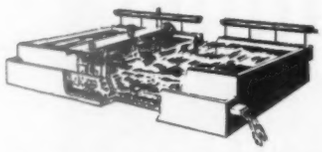
Elliptical throw vibrating screen.

claimed to leave maximum cloth surface available for the near size, which is pushed back by the opposed throw, turned and twisted until the required accuracy is obtained.

Should a stronger or a weaker throw be desired, adjustment may be made by the set screws of the inside pulleys on both ends of the off-balance-flywheel shaft. As a result of tests, the manufacturer claims that Plat-O screens can be overloaded without diminishing the throw. Deister also states that whipping or wear caused by looseness of the cloth is impossible, as the rear springs hold the cloth with a 5,000-pound tension per foot of cloth width. Specially prepared cloth screens are not necessary, and any deck can be changed without touching the others. Transmitted vibrations to the supporting structure and nearby equipment are cushioned by coil springs mounted on each side of the screen. Plat-O screens are manufactured in from 1- to 4-deck types, and in sizes ranging from 2½ feet by 4 feet, to 5 by 12 feet, with either open or closed screens.

● Sand Filter

The new automatic backwash sand filter which is being manufactured by the Hardinge Company, Inc., York, Pennsylvania, is said to be suitable for clarification of boiler feed water and for treatment of thickener overflow where a high degree of clarity is desired. This



Automatic backwash sand filter.

filter consists of a specially compartmented sand bed with underdrains, together with a backwash and cleaning mechanism traveling on tracks on the sidewalls of the filter tank and actuated electrically at predetermined differences in the head. The filter can be supplied in sizes varying from 3 feet to 16 feet in width and lengths to suit local conditions. The cleaning or backwash mechanism consists of a motor-driven slowly moving carriage which operates back and forth over the length of the filter bed. This carriage is equipped with two pumps, one a backwash type taking the filtrate from the effluent channel and pumping it back through the sand bed, and the other a wash-water pump for removing the dirty wash-water from the cleaner hood to the wash-water launder.

As suspended matter gathers on the surface of the filter bed, the filtering rate is decreased and the head in the filter tank begins to build up. At a predetermined level, an electrical contact starts the carriage and also the backwash and wash-water pumps. The backwash valve or shoe attached to the moving carriage rides over the effluent ports. Backwashing is usually done at a rate of about 10 gallons per square feet per minute. As the individual compartments are backwashed, the liquid level in the filter gradually recedes to normal and the cleaner carriage and pumps stop. The filter operates continuously as during the cleaning cycle only one compartment at a time is out of service.

● Wet Cells

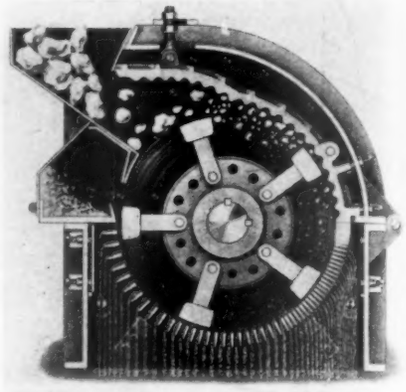
For users of large quantities of dry cells in flashlights or other electrical devices employing this type of cell, the B. F. Goodrich Company of Akron, Ohio, offers a rechargeable storage battery type of cell. The unit employs the principle of the standard 6-volt storage battery, and is said to have the physical size and

Rechargeable 1½-volt cell.

electrical output of two regular dry cells while providing more satisfactory service for greater periods of time. This wet cell, which has a plastic case, can be recharged when the potential falls below that required. These batteries are not recommended to users who require only periodic or infrequent service as they must be recharged every 30 to 60 days even though not used. The Goodrich company produces both a.-c. and d.-c. chargers for charging the cells. These are available as single units in a.-c. current or in 6-gang and 12-gang units in either a.-c. or d.-c. current. At least one charger is recommended for every 3 to 6 batteries used.

● Hammermill

A heavy-duty industrial hammermill is a recent product of the Diamond Iron Works, Inc., of Minneapolis. The housing is of all-welded, structural-steel-plate construction, and is said to be rugged,

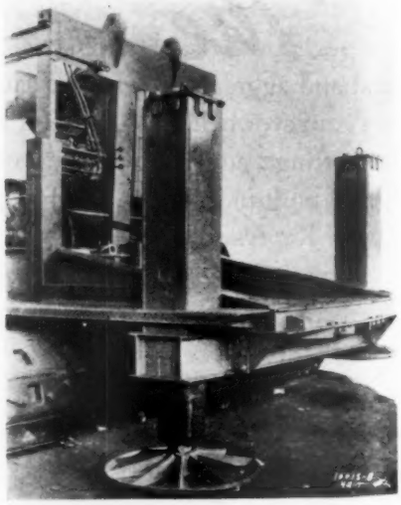


Heavy-duty industrial mill.

durable, and of sufficient weight without being cumbersome. Access for changing hammers and hammer positions is made possible by the sectional design; in addition, outside adjustments are provided for anvil and grate clearances. The large-sized balanced rotor shaft is of steel alloy, and the high-carbon-steel discs are double-keyed to the shaft. Extra take-up holes are provided for changing hammer arms. Continuous impact is possible with the extra long, corrugated adjustable anvil. If there should be a power stoppage for any cause, the grates can be lowered without opening the cover, and the machine cleans itself. Available for use with this machine are single-width, chipping, single- and double-end, and wedge-type hammers.

● Leveling Jacks

Increased production in blast-hole drilling is said to be obtainable with the new hydraulic leveling jacks made by the Bucyrus-Erie Company of South Milwaukee, Wisconsin. These jacks,

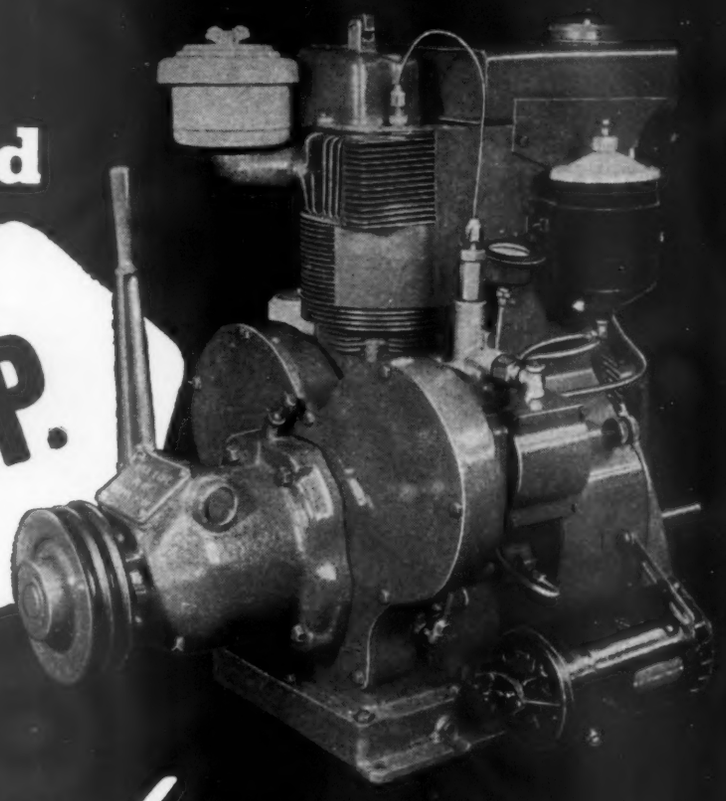


Leveling jacks for blast-hole drilling.

when used with the Bucyrus-Erie 42-T blast-hole drill, are reported to eliminate ground preparation, blocking and cribbing, and are controlled by valves located at the drilling end of the ma-

MEET THE BANTAMWEIGHT OF THE HEAVYWEIGHTS!

The New Air-Cooled 3¾ H.P.



Sheppard DIESEL

For the first time, Diesel economy and dependability are available in a small engine.

The new Model 14 Sheppard Diesel is not only the smallest Diesel (both in size and H.P. rating) ever built for commercial use... but it's also the *only* stationary Diesel that is *air-cooled.*

This absence of a liquid cooling system reduces the size and weight of the unit... and, more important, the time required for servicing and maintenance.

Overall the engine stands 28½" high, 20¾" wide, 22½" long with crank removed. It is a single cylinder, 4-cycle Diesel... developing 3¾ continuous horsepower at 1800 R.P.M. Standard equipment includes both hand and 12-volt electric starting. The engine—including power take-off and clutch—is complete, ready to operate, when shipped from the factory.

An indication of its economical operation is its fuel tank—it holds 9/10 of a gallon!

The Sheppard Model 14 is ideal for powering communication systems, auxiliary or standby lighting plants, pumps, conveyors and other power-driven equipment that requires a steady, dependable power source.

If you need a small engine you can install and forget—the new 3¾ H.P. air-cooled Sheppard Diesel is the one to remember. For complete information about this revolutionary new engine—mail the coupon today.

Available direct-connected to a 2 KW generator.

POWER UNITS, 3¾ to 56 HP • GENERATING SETS, 2 to 36 KW

R. H. Sheppard Company
113 Middle Street, Hanover, Pa.

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DIESEL'S THE POWER... *Sheppard's* THE DIESEL!

chine, close to the drill operating levers.

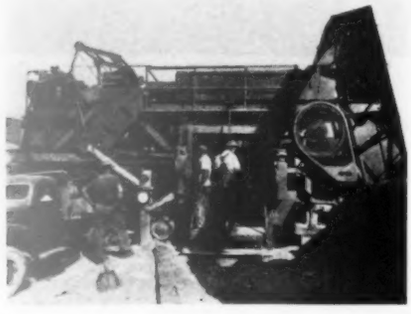
The jacks, three in number, are attached to and operate three spuds mounted on the drill frame, two at the drilling end and one at the power unit end. The jack cylinders are 5 inches in diameter, have a maximum travel of about 28 inches, and are operated with a maximum pressure of 1,500 pounds per square inch. Pressure for the jacks is supplied by a motor-driven pump on the electric 42-T and a pump belt-driven by the jack shaft, on the diesel machine. There are separate control valves for each jack. Two jacks are located at the drilling end of the 42-T operating platform and one at the opposite end, and all are operated from the same control station.

Pressure Switch

Originally designed for automatic control of the intercooler flap on fighter planes, an ultra sensitive diaphragm pressure switch is now available for other applications. Specifications received from the Aerotec Company of White Plains, New York, show a sensitivity of 1/100 of an inch of water on stationary applications. This instrument may be adjusted by means of two knobs to any pressure value desired. For accurately determining these pressures, a draft gauge may be connected in parallel with the pressure switch.

Mixing Plant

Two new portable asphalt mixing plants have recently been announced by the Iowa Manufacturing Company, Cedar Rapids, Iowa. The "Model F" is a portable, 2,000-pound, batch-type plant which can be set up for operation in minimum time because the only part that has to be raised is the elevator, which is of the telescoping type. Aggregate is



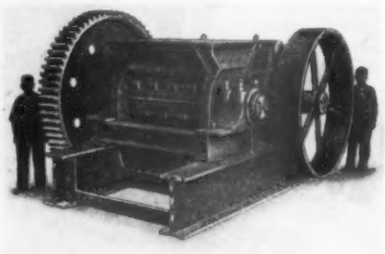
Portable asphalt mixing plant.

dumped into a hopper and elevated to a 36-inch by 10-foot triple-deck, horizontal vibrating screen, where it is graded and put into a 4-compartment (6 batch) aggregate hopper. Material passes into 25-cubic-foot batcher, proportioned to meet specifications.

A patented skip carries the material up to the 25-cubic-foot pug mill, where it is mixed and dumped directly into trucks for delivery to the job. The operator's platform is on the ground level, with all the controls centralized so that he has complete control of all operations. The Model F is mounted on pneumatic tires for trailer or semi-trailer hookup and can be used for hot or cold mixes with or without a drier. The second unit, is a continuous-mix type plant said to have a capacity of 25 to 30 tons per hour. This new plant is claimed particularly useful where small quantities of mixes are needed. All controls are within easy reach of the operator on the charging platform. A single-shaft, 16-inch by 10-foot pug mill is used to insure thorough, unvarying mixes. A fully enclosed, chain-type bucket elevator, 2-inch positive discharge, a rotary-type asphalt pump and an apron-type feeder are synchronized with the pug mill to provide rapid adjustment. It is available with or without running gear or drier, to permit its use as a portable or a stationary-type plant.

Crusher

An all-steel, heavy-duty primary for crushing shovel-loaded rock has been introduced by the McLanahan & Stone Corporation of Hollidaysburg, Pennsylvania, as the "Rockmaster." Low head-

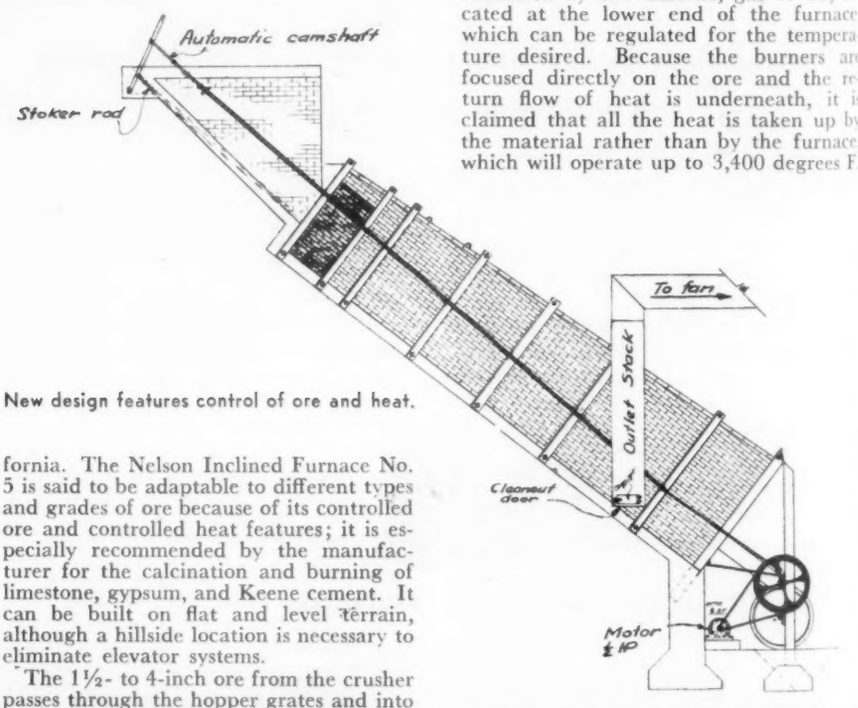


Heavy-duty primary crusher.

room, slow speed, quick adjustment, and automatic tramp iron protection are features claimed by the manufacturer for this new product. The Rockmaster also incorporates a steel segment roll, interchangeable and reversible crushing-plate liners, V-belt drive, and industrial-type lubrication.

Inclined Furnace

An inclined furnace, designed for the calcination, roasting, burning and processing of non-metallic ore, is the product of the Victor J. Nelson Engineering & Construction Company of Burbank, Cali-



New design features control of ore and heat.

fornia. The Nelson Inclined Furnace No. 5 is said to be adaptable to different types and grades of ore because of its controlled ore and controlled heat features; it is especially recommended by the manufacturer for the calcination and burning of limestone, gypsum, and Keene cement. It can be built on flat and level terrain, although a hillside location is necessary to eliminate elevator systems.

The 1½- to 4-inch ore from the crusher passes through the hopper grates and into the hopper and the furnace, with the stoker rods maintaining a flow of material. The speed of discharge is governed by a variable-speed motor which allows the ore to discharge rapidly or slowly. The necessary oxygen is brought in through the outlet door and over the hot ore being discharged, thereby pre-heating the air before it is brought into the fire chamber and at the same time cooling the ore to be discharged. The heat is furnished by two burners, gas or oil, located at the lower end of the furnace, which can be regulated for the temperature desired. Because the burners are focused directly on the ore and the return flow of heat is underneath, it is claimed that all the heat is taken up by the material rather than by the furnace, which will operate up to 3,400 degrees F. or higher if the special fire brick lining is used. It is also said that the hopper above the roasting chamber acts as a dryer, thereby eliminating all the free water.

Separator

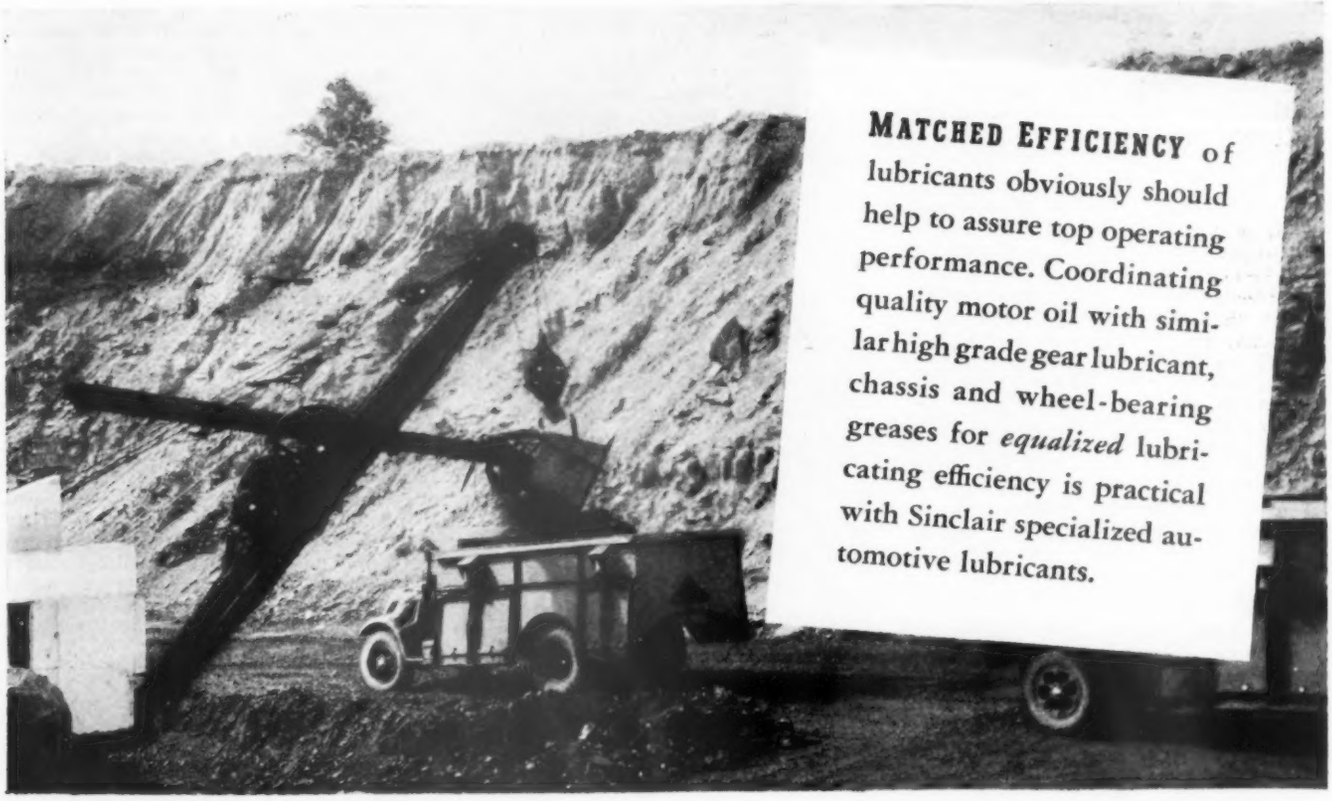
A new separator, known as "Airfuge," for removing moisture, oil and scale from compressed air is featured by the Swarthout Company of Cleveland, Ohio.

Centrifugal separator for cleaning air.

Utilizing the centrifugal principle, this new product claims simplicity of construction and operation. Air entering the inlet is diverted positively to the inner wall of the round body, and unwanted substances whirl around out of the air stream and drain to the bottom. The cleaned air may be taken off horizontally or vertically from pipe-tapped ports. An integral float-operated trap releases the condensate automatically, and the bottom may be removed if necessary for cleaning. The seperator is made of high-tensile iron; the interior parts are of corrosion-resisting materials. Airfuge is made in three sizes for varying capacities and with a range of pipe connection sizes.

For Top Operating EFFICIENCY

MATCHED LUBRICANTS



MATCHED EFFICIENCY of lubricants obviously should help to assure top operating performance. Coordinating quality motor oil with similar high grade gear lubricant, chassis and wheel-bearing greases for *equalized* lubricating efficiency is practical with Sinclair specialized automotive lubricants.

SINCLAIR OPALINE* MOTOR OIL offers positive engine lubrication, free acting rings, resistance to carbon deposit and crankcase accumulations, avoidance of bearing corrosion . . . OPALINE GEAR LUBRICANT provides extreme pressure lubricating protection to prevent galling and scuffing, resists oxidation under operating temperatures, and is free flowing under Winter conditions . . . OPALINE CHASSIS LUBRICANT has "staying" properties and built-in extreme pressure characteristics . . . and for wheel bearings SINCOLUBE is designed to meet service temperature and pressure requirements, also keep an adequate lubricating film on balls and rollers, with freedom from leakage to brake linings and hubs.

• • •

Try these matched lubricants for top operating efficiency and economy.

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SINCLAIR LUBRICANTS-FUELS

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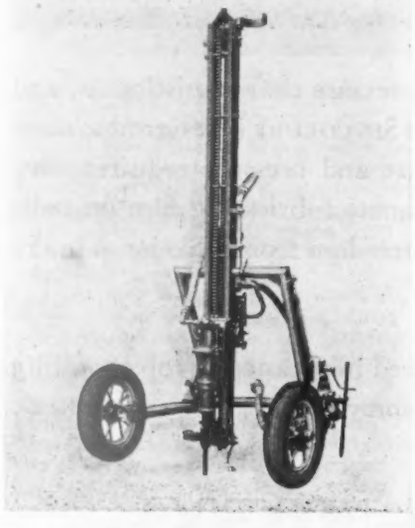
● Lubricator

A recent development of Balcrank, Inc., of Cincinnati, Ohio, is a portable "Minit" high-pressure lubricator which is designed for on-the-job service. Features of the Minit lubricator include the "Padl-Pak" tamping blade, which is said to eliminate air pockets without the use of bleeder valves. The manufacturer states that delivery of uncontaminated lubricant into the fittings at all times and in all weather conditions is possible as this device paddles and packs the grease as it pumps. The 30-pound-capacity Minit Can pump a 25-pound can of grease without sputtering. The "Jiffy Change" adapter, with a universal swivel as an integral part of the hose line, permits adapter changes for button-head, hydraulic or pin-type fittings. It is equipped with an accessory mounting bracket.

Portable high-pressure lubricator.

● Wagon Drill

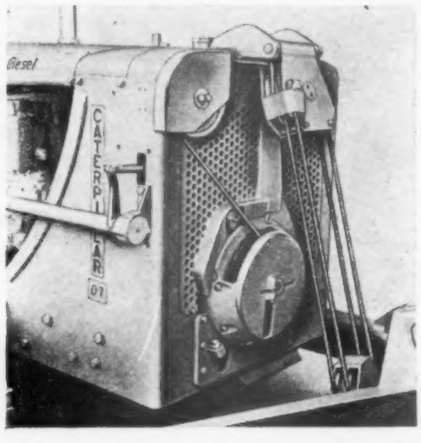
Worthington Pump and Machinery Corporation, Harrison, New Jersey, has in production a newly-designed Blue Brute Wagon Drill. The company's Construction Equipment Division announces that this model, the "UMW-40," incorporates several desirable design features. The UMW-40 uses a heavy-duty drifter, the cylinder of which has a diameter of 4 inches. It has rifle-bar rotation and Worthington positive-acting end-seating valve with circumferential seal. The cylinder controlled blowing device gives it hole-cleaning ability. A one-piece chuck-sleeve, a positive drill-steel locking chuck and an air hose with swivel to prevent fouling are added features. Heat-treated alloy steel is used in all major parts, and slow-rotation parts are available. The drifted may also be converted to wet drilling. Strong rotation, low air consumption and exceptional drilling speed are said to give low cost per foot of hole drilling.



Adaptable to wet drilling.

● Cable Control

Production of a new single-drum, front-mounted cable control embodying the multiple-disc-type clutch, which has been a performance feature of Caterpillar track-type tractors, is announced by the Caterpillar Tractor Company of Peoria, Illinois. Simple, easy operation of the new bulldozer for Caterpillar D8, D7 and D6 tractors is claimed to be possible with this new No. 24 front, single drum cable control, whose line pulls are designed to meet the most severe service requirements imposed by bulldozer operation. The line speed, bare drum, is 357 f.p.m. for the D8, 375 for the D7 and 525 for the D6. The line speed, full drum, is 527 f.p.m. for the D8, 552 for the D7 and 780 for the D6. Drum diameter for all three models is 9 inches, length 2½ inches, and drum flange diameter 14 inches. The cable size is ½ inch. Drum capacity is 75 feet; and the clutch has 12 friction surfaces with an area of 564 square inches.



Single drum, front mounted control.

The brake band diameter and width in each model is 15 by 2½ inches, and the effective brake area is 111 square inches, and the brake lining is molded. The approximate weight of each model, including adapter group, is 550 pounds. A major feature claimed for the new No. 24 cable control is rapid, positive action because the mechanism responds quickly to give accurate, powerful control with a minimum of operating effort.

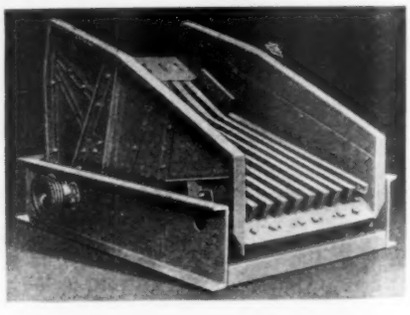
● Crushing Plant

The Cedarapids Junior Tandem Straightline Plant is the newest addition to the line of portable crushing plants offered by Iowa Manufacturing Company, Cedar Rapids, Iowa. By putting a portable primary ahead of the Junior Tandem the producer has a complete quarry plant, and the addition of a multi-bin unit with sizing screen makes it a multi-sizing gravel-or stone-crushing plant. Sprays, washing screens and sand tank then can be used to form a crushing, screening and washing plant. The Junior Tandem is made up of standard Cedarapids units with matched capacities and the material is said to flow in a steady stream from the feeder, through the plant and into the trucks or bins. A 10-inch by 24-inch roller-bearing jaw crusher, 24-inch by 16-inch roller-bearing roll crusher, 2- or 2½-deck, 36-inch by 10-foot horizontal vibrating screen, with the necessary conveyors, feeder and return wheel, are all operated by a single power unit through V-belts and universal drives. The entire plant is mounted on pneumatic tires. Weight and over-all dimensions meet all highway limitations.

Straight line portable crushing plant.

● Bar Grizzly

The Symons vibrating bar grizzly is recommended by the Nordberg Manufacturing Company of Milwaukee, Wisconsin, for scalping service when placed ahead of all sizes of secondary crusher and where clear spacing of 2½ inches and larger are permissible. This machine is built with a width of 42 inches and a clear lengthwise opening of 5 feet, and is said to be capable of handling up to 1,000 tons per hour of wet, sticky or gummy material. The smaller particles are separated from the larger ones upon contact with the grizzly bar, and as the feed progresses toward the discharge end, where the vibration assumes a more horizontal, straightline motion, these smaller sizes fall through the openings.



Manganese steel diverging and tapered bars.

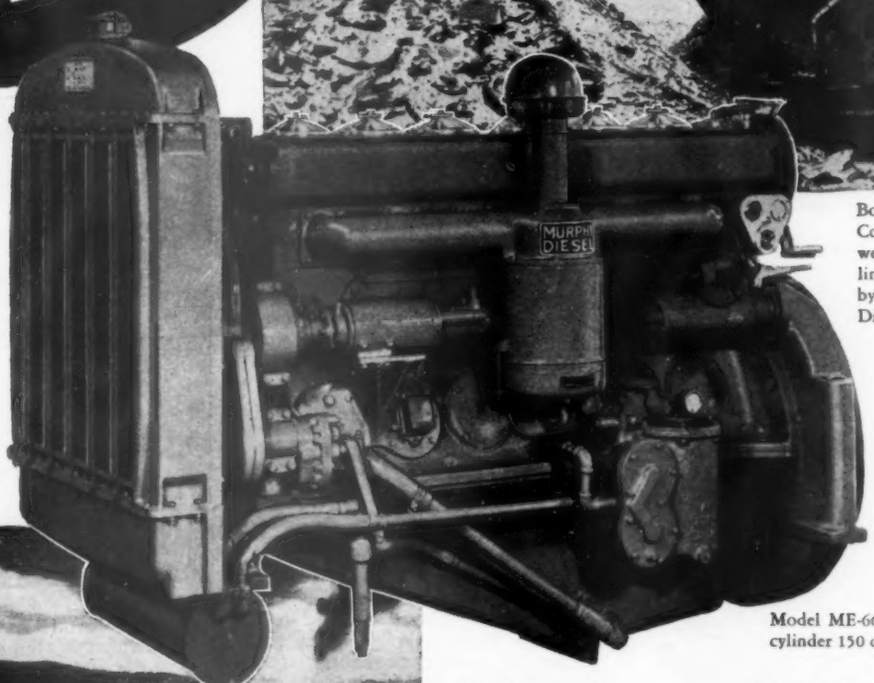
The bars are made of manganese steel, diverging and tapered end to end and top to bottom, and have an inclination of 30 degrees at the feed end and 15 degrees at the discharge end. The vibrating or power unit, consisting of a 7½-horsepower motor which is suitable for multiple V-belt drive, is located beneath the feed end where it is protected from rock and ore. The manufacturer states that the vibration will not dampen out with heavy loads, and the intensity of vibration can be changed by means of an adjusting nut.

RUGGED COMPACT DEPENDABLE

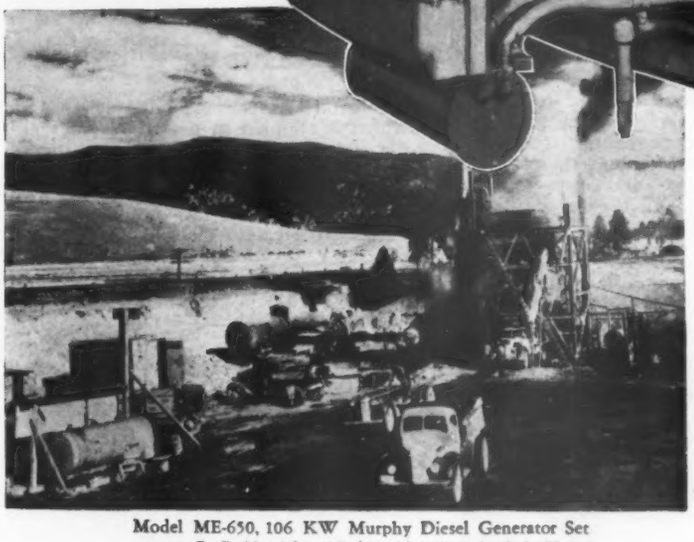
Booneville Coal Sales Corporation's "Northwest" Shovel and Dragline both are powered by Model ME-6 Murphy Diesel Engines.

Features:

- Murphy UNIT INJECTOR
- Safety Control
- Plain Open Combustion Chamber
- Hydraulic Servo-Type Governor
- Oil-cooled Pistons
- Precision Bearing-Shells
- Oil Cooler
- Electric Starting



Model ME-66, 6" x 6½", 6-cylinder 150 continuous H.P



Model ME-650, 106 KW Murphy Diesel Generator Set powers R. P. Herrick's "Cedarapids" Hot Asphalt Plant.

YEAR after year, MURPHY DIESEL Engines and Generator Sets continue to prove their outstanding value for heavy-duty equipment . . . where portable or stationary power is required in field . . . where rugged construction, compactness and relatively light weight, along with highest standards of dependability for heavy-duty service are demanded.

Easy to start, economical to operate and maintain, MURPHY DIESELS are making good on the toughest jobs. Specify MURPHY DIESELS on the next equipment you buy, and check their advantages for re-powering your present equipment. Making MURPHY DIESELS a "must" on your jobs means More Power, More Profit!

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More Power

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Reg U.S. Pat Off

More Profit

Engines: FROM 90 to 215 HP

Generators: FROM 60 to 115 KW

"FIELD-PROVEN *Power*"

105

● Dump Truck

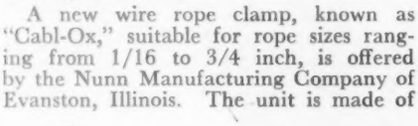
Six Wheels, Inc., of Los Angeles, California, recently announced their 25-yard, 50-ton-capacity, side dump truck as a new addition to their line of "Maxi" heavy-duty trucks and tractors. This unit

Fifty-ton side dump truck.

incorporates fluid drive and steering with eight speeds forward and two in reverse. It is of two-way side dump design and may be obtained with diesel, gasoline, or butane-operated engines.

● Rope Clamp

A new wire rope clamp, known as "Cabl-Ox," suitable for rope sizes ranging from 1/16 to 3/4 inch, is offered by the Nunn Manufacturing Company of Evanston, Illinois. The unit is made of



Alloy-steel wire rope clamp.

alloy steel, cadmium-plated for weather protection, and is designed to eliminate obstructions and loose ends. No special tools are required to apply this clamp. It can be used more than once, as it incorporates a new wedging action of its component parts, a feature which is claimed to make it possible for Cabl-Ox to hold record loads.

● Air Control

The Locomotive Works, Inc., Shovel and Crane Division, Lima, Ohio, an-

Shovel equipped with air control.

nounces the application of "Precision" air control to their Type 1201 shovel, crane and dragline. In shovels, air control is applied to the hoist, swing, crowd and propel clutches and to the dipper trip. On dragline, cranes and clamshells it is applied to the hoist (and the drag on the draglines only), swing and propel clutches. This type of control simplifies the assembly and eliminates many levers, reach rods, bell crank, etc. The Type 1201 weighs approximately 212,000 pounds when equipped with a 32½ foot boom, 22-foot dipper handle and 3-cubic-yard dipper. As a crane or a dragline it weighs approximately 192,000 pounds. Also incorporated in the design are independent clutches which make it possible to hoist, swing, travel and raise or lower the boom simultaneously.

The extra large diameters of the drums provide the longest possible cable life. Anti-friction bearings are used at every vital bearing point for smooth and economical operation. The crawler truck is 18 feet, 11 inches long and 12 feet, 7 inches wide and is of the end-drive principal, with the drive chains located back under the crawler tread. Steering is accomplished with the upper frame in any position.

● Belt Splicing

The "Extensible-Tip" in "Condor" endless belts is a patented strength-member development of the Manhattan Rubber Manufacturing Division of Raybestos-Manhattan, Inc., of Passaic, New Jersey. This method of joining belt ends is claimed to provide multiple stress relief, uniformly distributed over an area of the belt where the duck ends; in addition, the end is welded to the adjacent ply by elastic rivets made from special "Flexlastics." All warp threads in the outer plies are cut by suitably spaced perforations filled with live Flexlastics, which are then vulcanized to become elastic rivets. These are said to stretch and relax progressively as they pass over the arc of contact, providing stress relief for every warp thread, and thereby permitting the use of smaller pulleys on short-center drives and higher speeds.

● Shinguards

Shinguards for mine shuttle car tires which take a heavy beating far underground are among the latest conserva-

Protection for mine shuttle car tires.

tion developments of the Goodyear Tire & Rubber Company.

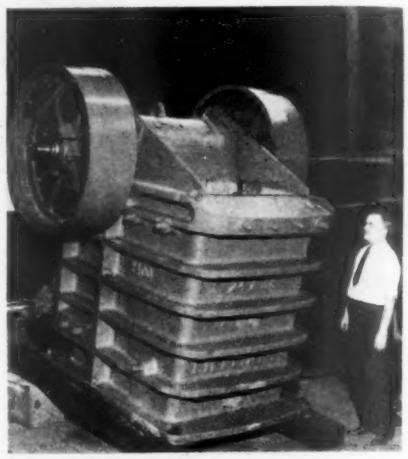
These tire shields are circular protectors of ⅜-inch steel which may be applied easily and quickly, extending far enough up on the tire to protect the sidewall area where cutting and snagging might otherwise occur.

Use of these shields reportedly has solved many tire failure problems in coal mines, where shuttle cars must move over sharp edges of fallen slate and rock and against projecting pillars of coal. No change in tire pressure is required.

The shields clear the tire, giving plenty of room for normal flexing without chafing of the sidewall. Shields on shuttle cars are designed for Goodyear L-type rims, with which most cars of this type are equipped. They fit in place in approximately the same position taken by the rim side flange, and are held in place by lock rings, furnished with the shields.

● Jaw Crusher

The Lippmann Engineering Works of Milwaukee, Wisconsin, has developed a new heavy-duty jaw crusher which is available in three sizes, 18 inch by 30 inch, 18 inch by 36 inch, and 24 inch by 36 inch. An added feature of this



Jaw crusher with extended jaw lengths.

new model is the extended jaw length, which is claimed to provide greater productive capacity and the ability to produce large amounts of finely crushed stone during the first crushing operation, thereby lessening the need for additional processing. According to the manufacturer, the design and increased steel strength at critical stress points throughout places this crusher in the heavy-duty class. Using the hardest specimens of granite nigger-head rock available, the Lippmann engineers carried out a series of crushing tests with this machine and report satisfactory results.

● Strengthened Belts

A different type of strength-member construction in conveyor belts developed by the Manhattan Rubber Manufacturing Division of Raybestos-Manhattan, Inc., of Passaic, New Jersey, is to be known as "Homocord." The component strength-members of these belts are sealed in to make a homogeneous, pliable belt that will flex around end pulleys. The Homocords, embedded in moisture-proof "Flexlastics" (an exclusive Manhattan trade mark), and mildew-proofed as additional protection, are said to have a flexible, resilient, rolling contact with each other to provide cushioned resistance for the heaviest feed impact. Longitudinal Homocords are groups to give tension strength and are tied together with cross Homocords which allow troughing for full loading of the belt, plus the strength to permit the use of fasteners. Among other claims made by the manufacturer, is that it possesses the virtues of a cord belt, with the drawbar strength and fatigue-resistance to hold metal fasteners.

● Carriages

The "Maxi-Cu" two-axle series of crane carriages, for all makes and types of cranes ranging from 5 to 15 tons, is another product of Six Wheels, Inc. The front axle is made of drop-forged, heat-treated steel with reverse Elliot-type knuckles; the outer hubs are the differentiating type. The oscillating axle has

Two-axle crane carriage.

wedge blocks at points where absolute rigidity is required. Steering can be controlled by the operator in any cab position, and is fully hydraulic. The drive is a reversible traveling-clutch, propel-shaft, miter-gear arrangement. The rear axle is two-point rigid-mounted, and the front axle center-mounted, making a three-point-mounted unit. Braking by the operator in any cab position is air-operated on all four wheels. Two-speed and four-speed transmissions are available for the CU series.

● Dipper

Augmenting the regular line of ESCO manganese products, the Electric Steel Foundry of Portland, Oregon, recently

General-purpose cast-welded dipper.

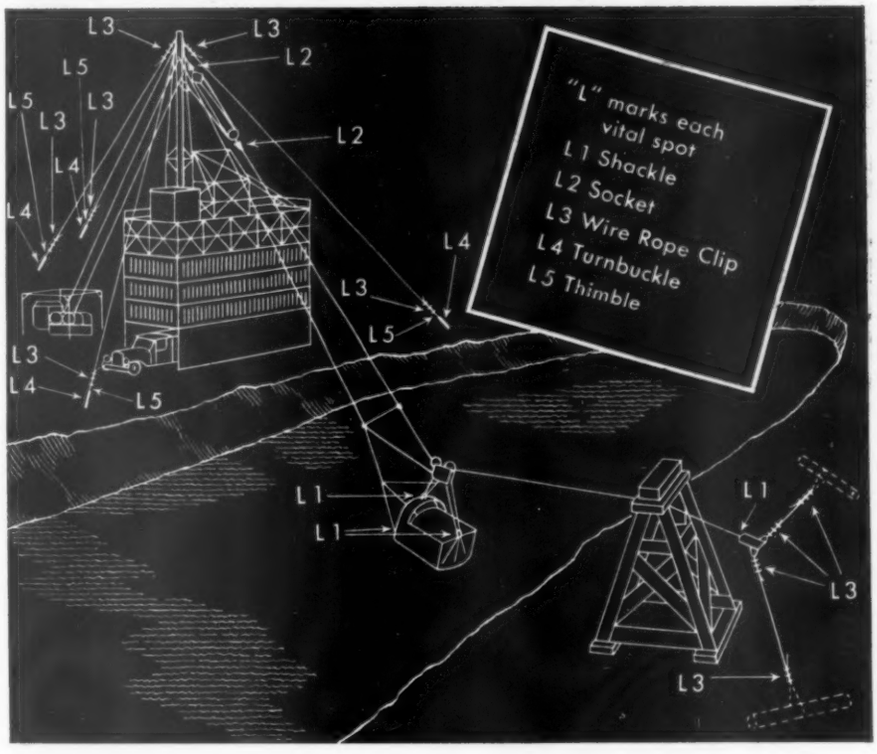
announced a new general-purpose cast-welded dipper. Offered in a size range from ⅜- to 5-cubic-yard capacity, the dipper is also available in larger sizes on special order. The principal advantage claimed is reduced weight through the use of manganese steel castings in the parts subjected to the most wear and shock. Recently developed techniques of fabrication and welding are employed in the sides of the dipper.

● Conveyor

Conveying by air, without air storage tanks and water and oil separators, is now possible by means of the "Convair" system developed by the Process Engineering Company of Johnstown, Penn-

HANG ON TO YOUR MONEY

WITH THESE DROP-FORGED FINGERS OF STEEL



Wherever you use wire rope or chain — for hoisting and material handling in your plant, aboard ship, or on drag-lines for stripping and excavating — you can save money three ways by specifying Laughlin drop-forged fittings.

1. Save money on purchase price . . . because you can get *standard* fittings for almost any purpose from Laughlin's complete line.
2. Save money on materials . . . because drop-forged fittings — acknowledged superior for strength and long life — give your equipment full protection.
3. Save money by avoiding accidents . . . because Laughlin's fittings have more safety features than any other line . . . examples: unique "Fist-Grip" Safety Clip and Safety Hooks.

For over 78 years, Laughlin fittings have been highly regarded for their rugged, uniform quality. For a catalog of these fittings, write today to Dept. 3, The Thomas Laughlin Company, Portland 6, Maine. Laughlin fittings are distributed through mill, mine and oil field supply houses.

LAUGHLIN

THE MOST COMPLETE LINE OF DROP-FORGED WIRE ROPE AND CHAIN FITTINGS

Yes, many contractors have done just that with KOTAL Master Mixes. An Indiana city engineer confessed he was amazed at the results when his contractor, working long before the normal time for spring repairs, merely swept the snow and water from the potholes and laid the KOTAL Mix right on the cold stone base.

And, that's not all! After slight tamping, traffic rolled over the repaired roads and found a remarkably firm, stable surface, practically the equal of any asphalt laid under ideal summer conditions.

Six Years of Use

have demonstrated the value of KOTAL Master Mixes as all-weather, easy-to-use mixes that help the contractor achieve tough, long-wearing roads.

Low Cost Application

KOTAL Master Mixes do not require skilled help to lay. Savings are shown on both time and labor costs.

The contractor who is looking ahead to those early spring repairs will find NOW a good time to study the benefits of KOTAL Master Mixes:

Eight Working Features of KOTAL Master Mixes

EASY TO USE. Quickly mixed, ready to lay. No preheating or drying.
STABILITY. Cure quickly and permanently. Do not shift, ravel or pick up. Open sooner to traffic.
WORKABILITY. Do not adhere to equipment. Work easily.
LONG-TERM STOCK PILES. Can be stock-piled for many months without losing workability.
SAVE TIME. Quickly made stock piles ready for immediate use without frequent fresh mixes.
SAVE LABOR. Actual road records prove fewer labor hours required.
SAVE MONEY. Savings in time and labor mean economies in road costs.
EXTEND PAVING SEASON. All-weather workability permits more months of operation.

Write for your copy of booklet which tells the story of KOTAL Master Mixes. We will also send you the name of your nearest supplier.

MASTER MIXES KOTAL **KOTAL COMPANY ★ 52 Vanderbilt Ave. ★ New York 17**

KOTAL *Master Mixes*

The Advanced All-Weather Aid in Building Better Roads

sylvania. This system provides dustless plant operation and functions only while conveying is in operation. It is self-cleaning, and avoids contamination where alternating colors or materials are conveyed at separate intervals. Should power fail during conveying, it is not necessary to dismantle the pipe lines to clean the system before resuming operations. The Convair employs small dust bags only where they are essential, as the dust concentration is low.

This system will convey powdered, granular, or lumpy material as well as mixed batches of various sizes, weights, and meshes. Breakage of granular material and wear on pipe bends by abrasives is said to be reduced by this manner of conveyance. Operations may be carried out either on horizontal or vertical lines with multiple-bin discharge. Convair can be operated by manual, automatic, or remote control and timed to handle predetermined quantities per minute or hour.

● Cleaner

For cleaning grease and hard-to-cut dirt from trucks and other heavy equipment, Turco Products, Inc., of Los Angeles, California, recommends its new Turco Chemical Vapor Cleaner, to be used with Turco compounds. Features

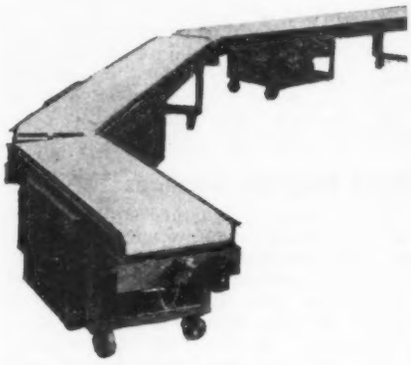
Vapor cleaner for dirt and grease.

of this cleaner include a down-fired burner mounted above the heating coil, rugged construction, air-cooled motor, thermostatic control, automatic electric ignition, and an economizer which automatically regulates the metering of the cleaning compound into the coil and the cleaning gun. The vapor spray is said to be hot enough to clean without burning and saturated enough to wet out and float away residue. Three Turco steam cleaning compounds are recommended for specific applications: Turco "Steam-Off" for the removal of the heaviest types of grease, oil, and grime from iron, steel, and structural surfaces; "Steameze" for all-purpose cleaner; and "Steam-Aero" for general light-duty cleaning of such metals as aluminum, copper, brass, and bronze.

● Spot Conveying

A recent development which permits "spot conveying' is the Power-Flex system produced by the Island Equipment Corporation of New York City. Made as

individual moveable units, special applications are possible by using one unit or more to provide a system meeting existing conditions. The "Power-Pac" drive



Multiple unit conveying system.

units, supplied on all Power-Flex equipment, are said to be timed to assure uniform speed from one end of a system to the other; and all tables are claimed to have a uniform speed of 50 feet per minute. All units may be hooked up in series and the entire assembly or system controlled from either end by positive push-button control. Two units will form angles up to 60 degrees maximum; three units will form a 90 degree turn. A system may be increased or shortened as desired without special wiring or fusing. Individually-driven units are available in 3- , 5- and 10-foot lengths, in belt widths of 12, 16, or 20 inches.

Loader

"Scoopmobile," a combination loader and lifter with a wide variety of applications, is a product of the Mixermobile Company, Inc., of Los Angeles, California. This three-wheeled unit drives and carries its load on the front drive wheels, which may be either single or dual. The single rear wheel provides the steering control. A complete unit on one chassis,

Three-wheeled combination loader and lifter.

the Scoopmobile has four speeds forward and one in reverse. Hoisting is independent of road transmission, as the power-take-off for hoisting is through three V-belts on the front end of the motor. The hoist winch is of the cable type and controlled with ball-bearing- mounted disc clutch and spring-loaded brake. The scoop may be tripped at any point on its up-and-down travel with an automatic safety stop at the top elevation. A single lever operates both hoisting clutch and brake. Scoop sizes range from ½ to 1½ cubic yards.

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Legal Decisions

By LEO T. PARKER

Many officials of nonmetallic mineral producing companies realize that "Every legal controversy may be avoided." Elementary legal knowledge of officials certainly will assist in conducting a business so that legal rights are preserved, and suits will be won. The explanations of the cause and outcome of these various law suits will be brief but readers who desire complete details may, by reference to the citation, obtain and read the complete decision at any good library. Clip these citations for future use.

"Use" Tax Law Litigated

Various states lately have enacted "use" taxation laws. According to a new higher court decision a state can assess "use" taxes *only* on the actual value of rock, and similar materials in a construction job. For example, in *Gray-Knox Marble Company v. Evatt,* 16 Ohio Supp. 151, reported 1945, it was shown that the marble company, located in Tennessee, took a contract to furnish the labor and materials necessary to complete marble work in a building in Ohio. The Ohio authorities contended that the company was liable for payment of "use" tax on the complete marble work, of the contract price of $48,883. The higher court refused to agree with this contention, but held that the company was liable for payment of "use" tax on the marble valuation based upon the actual cost of the marble, including the labor cost of fabricating it.

Generally speaking, products sold for a single "use" is taxable under the state sales tax law. This is so although such sales are made to purchasers who do not consume the merchandise. See *Carpenter,* 144 Pac. (2d) 770.

Must Pay for Services

Irrespective of whether a person fails to agree to pay for services rendered, the one benefited must pay the reasonable, or customary value for such work or services. For illustration, in *Doll v. Albert Weiglen Marble & Granite Company, Inc.,* 22 So. (3d) 59, reported July, 1945, a real estate broker sued the marble company to recover his brokerage commission for services performed in procuring a lease for the company. The officials of the company defended the suit on the contention that although the broker had secured the lease, there was *no* promise or agreement to pay the broker for his services. However, the higher court held the company liable for payment of 5 per cent commission.

Injured Employee Signs Final Receipt

According to a late higher court decision if an injured employee signs a final receipt for compensation received for an injury, he cannot reopen his case. For example, in *Hartman v. Pennsylvania Salt Manufacturing Company,* 38 Atl. (2d) 431, reported September, 1945, it was shown that an employee suffered an injury in the course of his employment. He was paid compensation until he returned to work, when he signed a final receipt. He continued in his employment for 4 months and was then discharged because of the mechanization of his employer's plant. The employee filed suit to have the compensation extended on the ground that his injury prevented him from taking other profitable employment. However, since the employee had signed the final receipt, the higher court refused to allow additional compensation.

Also, see to the same effect *Vetrulli v. Wallin Concrete Corporation,* 144 Pa. Super. 73 and *Kennedy v. Holmes Construction Company,* 24 A. (2d) 451.

Claim Delayed

According to a late higher court decision an employee who contracts silicosis must file his claim within a reasonable time, or he will be denied compensation under the State Workmen's Compensation Act. For example, in *Williams v. Industrial Accident Commission,* 161 Pac. (2d) 979, reported November, 1945, the testimony proved that an employee in 1936 quit work and took a job as night watchman. In 1940 he was informed by two physicians that he was afflicted with silicosis. However, he failed to establish a claim for compensation for disability and continued to work as watchman until 1942. The higher court refused to allow compensation, saying: "He was aware in 1940 that he suffered silicosis. Since 1936 to November 25, 1942, he worked as a watchman for this employer . . . The claim herein is therefore barred by the Statute of Limitations."

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Insurance Company Liable

A majority of insurance policies carried by companies for protection against the injuries and deaths of employees contain a clause stating that the insurance company will not be responsible for employees of independent contractors. Notwithstanding this clause the insurance company is liable for the injuries and death of employees of an independent contractor, if the accident was caused by any thing or conditions on the corporation's premises.

For example, in *Gulf Portland Cement Company v. Globe Indemnity Company,* 149 Fed. (2d) 196, reported August, 1945, it was shown that a company carried an insurance policy by the terms of which the insurance company agreed to defend all suits against the insured except suits for injury or death caused by the work of an independent contractor. The company employed an independent contractor named Peterson to erect and operate a pile driver. Several employees of Peterson were either injured or killed on the premises of the cement company, when a deadly current of electricity jumped from high-tension wires to Peterson's pile driver on which such employees were working.

The insurance company denied liability on the ground that the insurance policy clearly does not cover injuries or deaths resulting from work done by any independent contractor. Further testimony showed that (1) the pile driver belonged to Peterson and it was erected under his direction and control; (2) the pile driver was being erected by Peterson's crew for the purpose of sinking some test piling in order to ascertain sub-surface data for the cement company; and (3) the power line was used for the purpose of transmitting electric current to the cement plant of the company for its use in the manufacture of cement.

Notwithstanding the above clause in the policy, the higher court held the insurance company liable, and said:

"Undoubtedly, the work was being done by, and the men were under the supervision and control of, an independent contractor. But the injuries and deaths were not 'caused by' the work of the independent contractor."

Employee Worked for Several

Sometimes it is difficult to determine who is liable for the payment of compensation for the injury or death of an employee who works regularly for more than one employer. The jury must make this decision. For example, in *Texas Employers' Insurance Association v. Felt,* 150 Fed. (2d) 227, it was shown that a workman was killed while operating a tractor for one of several persons engaged in heavy excavation work. The deceased met his death about 9.30 a.m. No witness saw exactly what occurred, but he was found pinned beneath his overturned bulldozer on a roadway. The truck used to haul the bulldozer from place to place was near with the loading ramp attached. The jury decided that the contractor who paid the employee to transport the bulldozer was liable as the legal employer. This decision was based upon the evidence that apparently the employer had driven the bulldozer from the truck just prior to his death.

Statute of Frauds

The law of sureties is simple to one who *knows* it. Assume that Mr. Whitmore says to the seller: "Let Mr. Smith have

Broad claims may be advanced for any piece of equipment, but . . . . . .

It's what users say that Counts!

An operator who has used Eagle Sand and Gravel Screw Type Washers for many years states: "*We have used the 'Spiral Screw Washer' for 12 years without complaint. Our material, classified with this washer, passes the state specifications, and has a cleanliness test of 99½%. Operating costs are absolutely nothing compared to the efficiency and output of the Eagle Screw Washer.*"

A Kansas user writes: "*I do not know of a deposit that has a worse clay ball condition than ours. Your washer gets the job done and our clay ball worries have been over since installing Eagle equipment.*"

An Illinois operator says this regarding his Eagle 18" Screw Type Gravel Washer: "*This machine is giving extremely satisfactory service. We wash about 200 yards of gravel per day, and are very effectively removing chunks of blue clay and waterlogged wood. We are feeding this washer with gravel which is much too small, yet it does an excellent job of cleaning.*"

Before installing an Eagle Screw Washer, the Waters Sand Co., Manhattan, Kans., had difficulty meeting specifications because of dirt and clay in the material they were shipping. Later they wrote: "*After installation of the Eagle Washer, our sand and gravel had a finer texture. Prospective customers became actual customers. We find the upkeep comparatively small, with no expensive parts to replace.*"

N. C. Carroll & Sons, Pratt, Kans., reports that 500,000 yards of gravel had been washed in 16 months with its Eagle Log, and that mud ball trouble previously encountered had been totally eliminated.

For every operating condition, there is an Eagle Washer which will make good. Send for Catalog No. 44 for full information on Eagle Log Washers, Screw Washers, Shale Removers, Classifiers, Dehydrators and Special Sand and Gravel Plant Equipment.

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"SWINTEK" DREDGE LADDERS — SCREW WASHERS
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all the supplies he wants, and if he does not pay you I will." This is a surety obligation and absolutely *void* unless in writing. On the other hand suppose Mr. Whitmore says: "Let Mr. Smith have all the supplies he wants and I will pay you." This verbal contract is valid because Whitmore said "I will pay you," in other words, he assumed direct responsibility. On the other hand, in the former case he said that if Smith does not pay you, I will. This is not a direct obligation on the part of Whitmore, as a surety to pay Smith's debts. It is void in all states of the United States, unless *reduced* to writing.

For illustration, in *Foley v. Currie,* 189 S. W. (2d) 349, reported November, 1945, it was shown that a general contractor verbally promised to protect a material man's interests as respects sand and gravel furnished to subcontractors. In the subsequent suit the higher court held this verbal contract void, because it is a "surety" contract and not valid unless in writing. This court said . . . "their (contractor's) alleged liability was in violation of the statute of frauds."

Also, see *Chickasaw Company v. Blanke,* 185 S. W. (2d) 140, reported April, 1945, where a company executive made a verbal agreement by which the company should become liable as surety for debts incurred by a purchaser. The higher court held this verbal contract void, and explained that all surety contracts must be in writing.

Taxation Rules

For taxation purposes a company which extracts valuable products from the earth must use the sales value rather than the mine value. Also, all operating expenses incurred must be prorated over the period the improvements *may be* used.

For example, in *New Idria Mining Company v. Commissioner of Internal Revenue,* 144 Fed. (2d) 918, reported January, 1945, the question presented was whether for taxation purposes the mine-run value was to be taken or whether it was proper to use the sales value of the material extracted from the mine. This court held that the market value of the finished product, as reflected in gross sales, and not the market value of the cinnabar ore from which the product was extracted, is the proper valuation for taxation purposes.

Also, in this case it was shown that the mining company paid to a utility company several thousand dollars to cover the cost of extending a power line to the mine so as to obtain power service in operating the mine which had a prospective life of only three years. The higher court held that this cost was deductible as expense and should have been prorated over the probable life of the operation.

And see *Commissioner of Internal Revenue v. Longhorn Portland Cement Company,* 148 Fed. Rep. (2d) 276, reported May, 1945. This court held that all expenses incurred in the *successful* defense of a suit to impose a fine or a penalty against the business are deductible in computing income tax as "ordinary and necessary business expenses." On the other hand, this court held that a fine imposed on the business or corporation as a *penalty* for violating valid laws is *not* deductible. This court said that allowance of a fine, for example, for violation of anti-trust or similar laws would frustrate the purpose and effectiveness of public policy.

Contract Valid

Generally speaking, a valid contract must contain a clause by the terms of which both parties are obligated to perform a definite service. For example, in *McCall v. Texas Dragline Service Company,* 188 S. W. (2d) 243, reported July, 1945, it was shown that a contractor agreed to rent and purchase from a company *all* the equipment and material it would require on a construction job. Although nothing was definite as to the quantity of equipment needed, nor the length of time it would be needed, the higher court upheld the validity of this contract saying that the contract was sufficiently definite to be valid.

Inexperienced Employee Is Injured

Modern higher courts consistently hold that where an employee, by reason of inexperience, does not fully realize or appreciate the danger of particular work, it is employer's duty to give him proper instructions and to warn him of latent dangers. Failure of the employer or his agent to do so always will entitle the employee to sue and recover heavy damages for an injury. For illustration, in *Ideal Cement Company v. Hardwick,* 185 S. W. (2d) 266, reported March, 1945, it was shown that a company owned an electric crawler shovel which was used to load rock from a quarry into cars on an adjacent electric railroad track. The machine was operated by electricity taken from a high-tension line carrying 2,500 volts and supported by poles along the railroad track, by the use of a flexible cable attached to the shovel at one end and to a box on a pole at the other end. In order to move

ONE OPERATION

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● **TO THE ENGINEER,** particularly, this action drawing is enlightening. It shows the operation principle of the "Thermomill" and Loop Classifier—the "Thermomill" simultaneously drying and grinding materials containing moisture—a combination of mill, classifier, and heater. No independent dryer needed. See why a "Thermomill" saves you money?

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the shovel, as the work of loading rock onto the cars progressed it was necessary to detach the cable from a pole and attach it to another nearer the shovel. Each pole along the railroad has attached to it what is called a "take-off box," to which the end of the flexible cable is attached to get power to operate the shovel.

For several years an employee had worked as a common railway laborer, to maintain the track of the very short line of railroad in the company's quarry. He performed no other kind of work. One day a foreman of the company directed the employee to disengage the electric cable from a pole to which it was attached. The employee was inexperienced in this operation and the foreman did not warn him regarding the danger. The employee received an electric shock causing severe injury for which he sued the company for damages. The higher court held the company liable for $3,250 damages because the foreman had failed to warn the employee that the operation of disengaging the electric cable was dangerous.

Seller Repossesses Machine

Considerable discussion has arisen from time to time over the legal question: If a purchaser defaults in making agreed monthly payments on machinery or equipment, what is the liability of the seller? The answer to this question was clearly explained in *Multiplex Concrete Machinery Company v. Saxer*, 17 N. W. (2d) 169, reported 1945. This court held that a contract is valid which requires a purchaser to pay a reasonable sum for breaching assumed obligations to make agreed payments on equipment purchased under either a conditional contract, or a chattel mortgage; the purchaser may be held liable for damages caused a seller where the equipment is unlawfully detained, although the seller later by suit repossesses the equipment; if the purchaser defaults in making payments and offers to give up possession of the equipment, the seller may repossess the equipment but the seller can not recover damages; and if the seller prefers, he may sue the purchaser for the remainder due and compel the purchaser to keep the equipment.

Can Not Sue State

According to a late higher court decision no suit may be filed against a state without the consent of the proper state authorities. Moreover, the fact that the suit is filed against state officials will not change this rule of law.

For illustration, in *Bachman v. Iowa State Highway Commission*, 20 N. W. (2d) 18, reported November, 1945, a suit was filed, by a seller of stone, against the Iowa State Highway Commission to recover $760. The seller proved that the commission had contracted to purchase 1,000 cubic yards of crushed stone at $1.86 per cubic yard for road maintenance. The stone was to be delivered at certain locations "in neat piles of regular shape and contour." The quantities were to be determined "by taking cross sections of the stock pile." The seller alleged that while he furnished the full amount of stone in piles according to the contract, the commission, before measurements were or could be made, hauled a large quantity of the stone and scattered it upon the highway.

How Difficult Machining of Manganese Steel Cutter Heads Is Accomplished.....

"The toughest steel known" is by the same token far from easy to machine. Frequently manganese steel is a "must" for some part where machining of the most difficult nature is also a requisite. In many such cases, ingenuity has proved equal to the problem.

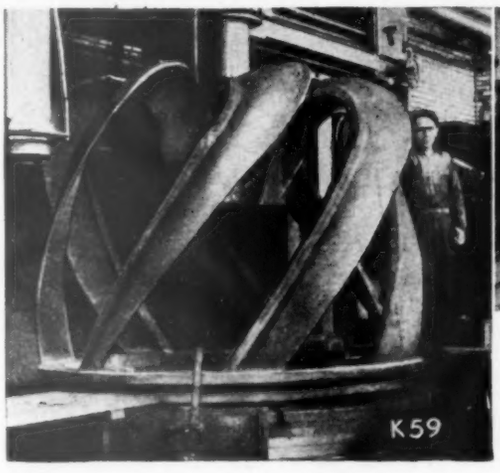
Austenitic manganese steel, because of its incomparable resistance to impact and abrasive wear, has long been the accepted material for dredge cutter heads. Picture K-59 shows an Amsco cutter head which was made for a tidewater pipeline dredge employed in harbor improvements and land reclamation.

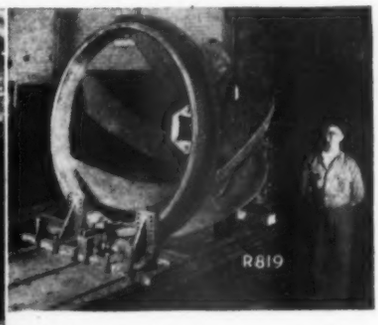
This 8,062 lb. manganese steel, seven-blade, plain basket type, rotary cutter head for clockwise rotation was made with the back ring, blades and hub cast integrally. It was photographed during the finish grinding of the hub bore.

The completed cutter head includes a threaded bore for attachment to its shaft. As manganese steel is difficult to cut or thread, a pre-machined carbon steel piece was employed for the threaded portion and securely locked in place. In the manganese steel portion of the hub, the circular bore details include a shoulder collar at the rear face end for definitely fitting the hub center, which is set into its position with a shrink fit. The hub center is additionally secured in place with a heavily welded seam at the circular edge of the front end face.

The outside diameter of the threaded portion of the shaft is $13\frac{29}{32}$". Overall length of the completed cutter head is 5'11¼", the inside diameter of the back ring is 6'4", and the outside diameter of the heavy angle section 7'3".

A number of designs of Amsco cutter heads are available. Ask for Bulletin 844-D, "Manganese Steel for All Dredging Purposes."





R-819. Another Amsco cutter head, photographed during the bore-planing operation. Designed by customer for digging gravel, hard-pan mixtures and the cutting of stumps and roots in cypress swamps. Weight 4464 lbs.; overall diameter 6'1¾".

Bulletin 940 tells why Amsco-Nagle Centrifugal Pumps Are Ideally Suited for Gravel Washing Plants.

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With respect to the suit filed against the state, the court said:

"Whether the claim for damages be considered to be in tort for wrongful conversion of plaintiff's property, or for breach of plaintiff's contract with the state, it can not be asserted against the state, directly or indirectly, and payment compelled out of state funds."

With respect to suing members of the highway commission, the court said:

"If there is any legal liability on account of wrongful acts already committed by the individual defendants, that question may be litigated against them individually in the further progress of the case."

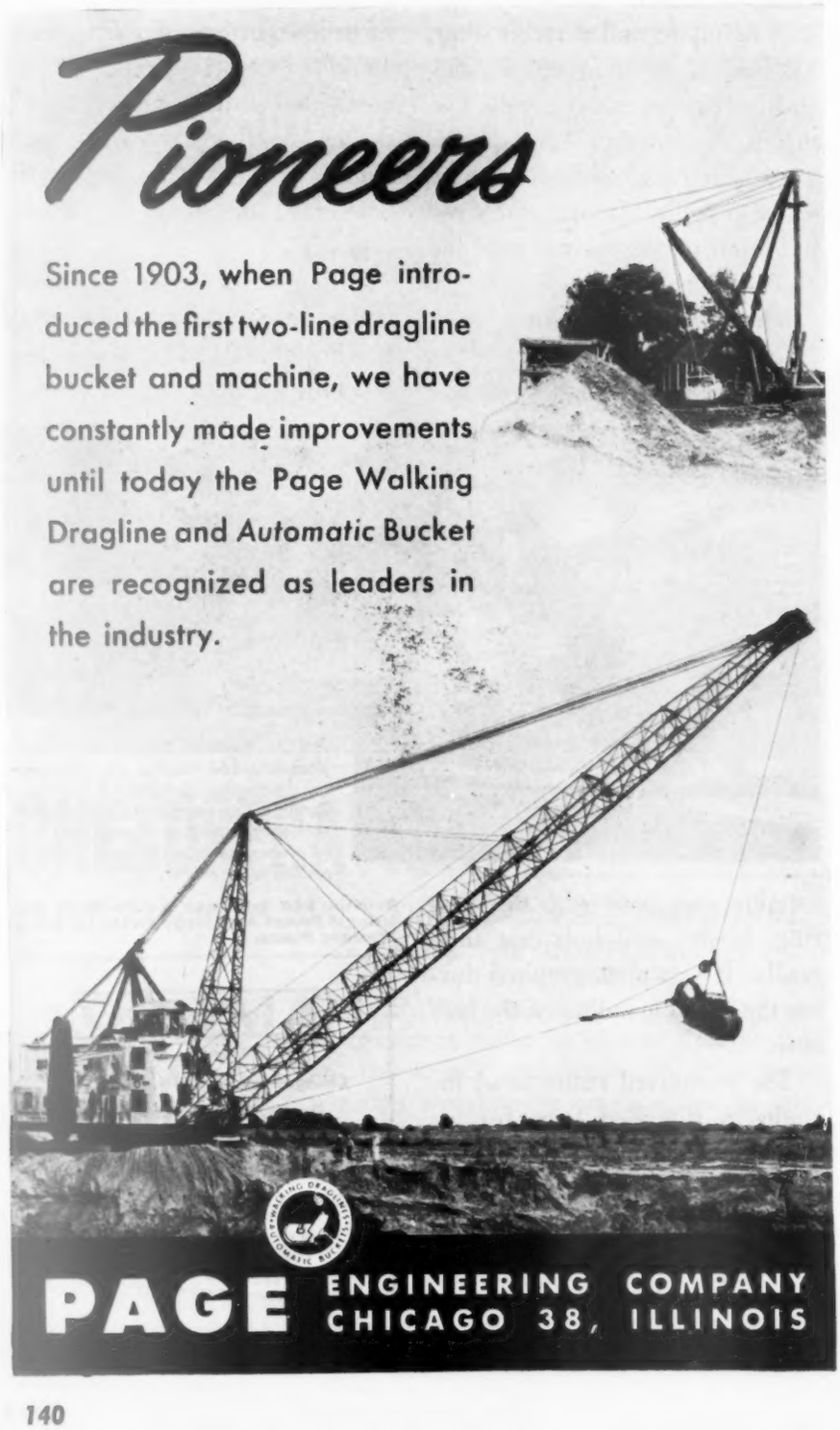
Also, see *Wilson v. Louisiana*, 110 N. W. 1045, where a seller sought to compel payment of his claim out of state funds by compelling state officials to audit and approve it and execute a voucher for its payments. The court said:

"It is fundamental that a state can not be sued in its own courts without its consent, and it is a further rule that a litigant will not be permitted to evade the general rule by bringing action against the servants or agents of the state to enforce satisfaction for claims."

What Is Legal Discharge?

Considerable discussion has arisen from time to time over the legal question: When is an employee legally discharged from his work? The answer to this question is important because a "discharged employee" is entitled to recover payments under the State Unemployment Act, or the employee may sue and recover damages from the employer who breaches an employment contract; or the employer may be liable under state laws, etc. Therfore, it is important to know that where an employee is merely temporarily "laid off" he is not legally discharged.

For example, in *Neid v. Tassie Company*, 17 N. W. (2d) 357, reported 1945, it was shown that the Tassie Company and a union entered into a contract which provides that when an employee is discharged without cause the employer must pay him 15 days' wages. One morning when an employee came to work he was told that there was no work for him that day because of the company's inability to procure goods. The employee sued the company for damages for violating the union contract and, also asked the court to allow him 15 days' wages. The employee claimed that he had been illegally discharged. The lower court rendered a decision in favor of the employee, but the higher court reversed the decision, saying: "The temporary cessation of operations was not a discharge within the meaning of the contract, and the penal statute does not apply."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Questions and Answers

[Mr. Parker will be glad to answer questions regarding legal problems of PIT AND QUARRY readers. Questions should be addressed to Leo T. Parker, Legal Editor, PIT AND QUARRY.—Ed.]

Legal Editor: Suppose an employee does both intrastate and interstate work. How can we tell what part of the work must be paid on the basis required by the Fair Labor Standards Act?—K. C. C.

Answer: According to a late higher-court decision an employee who performs both intrastate and interstate work is entitled to be paid full wages under the Fair Labor Standards Act, for all his time, if his employer fails to keep accurate records of the time the employees perform intrastate work. See *Atlantic Company v. Weaver*, 150 Fed. (2d) 843, reported September, 1945, where it was shown that employees worked in interstate and also intrastate business, but that the time was not separated by the employer. The employees sued their employer to recover back wages and attorneys fees, based upon full time, under the Fair Labor Standards Act. The higher court held in favor of the employees although they performed both intrastate and interstate work. This court said:

"It is not important whether the employer is engaged in interstate commerce. It is the work of the employee which is decisive."

Thus, it is advisable that all employers, who do not pay wages specified by the Fair Labor Standards Act, keep clear records as to the time during which their employees perform services in the two kinds of work, namely interstate and intrastate. Of course, the employer must pay the wages required under the Federal law to all employees who do interstate work.

Legal Editor: Can you inform me correctly regarding whether I am liable for an injury of a subcontractor's employee who works on my job. I am a general contractor. Can you cite me a decision for my attorney as I have a suit on my hands?—J. C. T.

Answer: Your question really asks: If an employee of a subcontractor is injured through the fault or negligence of the general contractor can the employee recover damages from the general contractor?

According to a late higher-court decision all the employees of subcontractors are expected by the law to decide for themselves whether the places in which they work are safe. For illustration, in *Rivera v. Goodenough,* 162 Pac. (2d) 498, reported November, 1945, it was shown that a man named Rivera was employed by a subcontractor. While installing trusses Rivera was injured when a post erected by the general contractor fell over while Rivera was working on a ladder braced against the post.

Rivera filed suit against the general contractor to recover damages for the injury. He contended that his injury and subsequent disability resulted from the negligence of the general contractor in erecting and bracing the post. The counsel for the general contractor argued that it was the duty of Rivera to *determine for himself* whether the post was strong enough to support a ladder. The jury held Rivera *not* entitled to recover damages from the general contractor. The higher court approved the verdict.

Of course, Rivera is entitled to receive payments of compensation under the State Workmen's Compensation Act, since his employer, the subcontractor, contributed to this workmen's compensation fund.

Therefore, according to this higher court decision you as a general contractor are not ordinarily liable in damages for injuries sustained by the employee of a subcontractor.

Legal Editor: Is it unlawful for us to sell our products at a higher price in one state than in another?—W. & S.

Answer: It is well-established law that all contracts, combinations, or agreements which create or tend to create a monopoly are unlawful. However, unless definite proof is given that a company actually violates this legal rule it is *not* liable for violation of any anti-trust law.

For example, in *Willard Company v. American Company,* 22 So. (2d) 461, it was alleged that a company sold its products in Texas for less than it sold the same product in Florida. Suit was filed for violation of the Clayton and Robinson-Patman Acts. The higher court held that the company had not violated these laws.

You can read the complete details of this case in any good library. Also, many other interesting cases are cited in the decision rendered by this higher court.

Los Angeles Delivery Map

In coöperation with the Southern California Rock Products Association and Southern California Ready Mixed Concrete Association, a Los Angeles map-printing concern has published a Renié Atlas containing large-scale sectional maps of Los Angeles and Orange Counties and defining delivery zones and their subdivisions in detail.

Large zone maps have hung on the walls of the offices of various producers in the Los Angeles area and before the desks of their dispatchers for several years, ever since the industries established the zone-price system. In the new atlas form, both in desk and pocket sizes, reference to the book enables salesmen, contractors and others quickly to find the delivered price for aggregates or concrete to any point in the area.

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TRAFFIC News Digest

CENTRAL FREIGHT ASSOCIATION DOCKET

Docket 78951 (2) — Lime, common, hydrated, quick or slaked, carload minimum weight 30,000 pounds and 50,000 pounds. Establish on, from Speed, Ind., to Rainelle, W. Va., 462 cents net ton (minimum 30,000 pounds) and 374 cents net ton (minimum 50,000 pounds).

Docket 78972 (2) — Slag, commercial crushed, carload in bulk in open-top equipment, minimum weight 90 per cent. of marked capacity of car, except that when car is loaded to cubical or visible capacity, actual weight will apply. Establish on, from Allegheny (Pittsburgh North Side), Junction Transfer (33rd Street Station) Pittsburgh, Bessemer, Rankin, Pa., to Webster Springs, W. Va., 231 cents net ton.

Docket 79019 (2) — Sand (except blast, core, engine, filter, fire or furnace, foundry, class, grinding or polishing, loam, moulding or silica) and gravel, in open-top cars only, minimum weight 90 per cent. of marked capacity of car except that when car is loaded to full cubical or visible capacity, actual weight will apply. Establish on, from Lafayette, Ind., to Watseka, Ill., 105 cents net ton.

Docket 79021 (1) — Agricultural limestone, unburned, in bulk in open-top cars, carload minimum weight 90 per cent. of marked capacity of car, except that when cars are loaded to full cubical or visible capacity, actual weight will apply. Establish on, from St. Joseph, Mich., to Crown Point, Ind., 133 cents; Gary, Ind., 129 cents; LaPorte, Ind., 94 cents; Michigan City, Ind., 84 cents; Mishawaka, Ind., 129 cents; and South Bend, Ind., 123 cents per net ton.

Docket 79106 (1) — (a) Rubble stone, minimum weight 90 per cent. of marked capacity of car, except that when car is loaded to full cubical or visible capacity, actual weight will apply. Cancel rates on, as published in items 465 and 475 of B.&O. tariff H-3336-E, Ohio No. WL3711, from Findlay, O., to Chase, Deweyville, Hancock, McComb and Murphy, O., 108 cents; from Piqua, O., to Belt Line Junction, 184 cents; Cheviot, O., 146 cents; College Corner, McGonigle, O., 184 cents; Miami, O., 146 cents; Oxford and Woods, O., 184 cents per net ton, account obsolete. (b) Stone spalls, subject to minimum weight as shown above, published in Item 480 of B.&O. tariff H-3336-E Ohio No. WL-3711. Cancel rate on from Sandusky, O., to Toledo, O., 84 cents net ton. Classification basis to apply in lieu thereof, account obsolete.

Docket 79161 (2) — (a) Sand, moulding, bonded (naturally or otherwise), in all kinds of equipment; sand (except sand, moulding, bonded—naturally or otherwise—and except ground or pulverized sand), in closed equipment; (b) sand, ground or pulverized, in all kinds of equipment; (c) sand (except sand, moulding, bonded—naturally or otherwise—and except ground or pulverized sand), in open-top equipment (see Note[1]); gravel, in open-top equipment (see Note[1]), applicable only from Mahoning, O. Establish on, from M.&S. Valleys Groups to Wyano, Pa., (a) 165; (b) 182; per n. t.

Note[1]—Rates will not apply on shipments in cars with tarpaulin or other protective covering. In such instances the rates applicable on shipments in box cars are to be assessed. For minimum weights see Note 1, page 7, of Erie Railroad Tariff 104-K, ICC 7464, as amended.

Docket 79166 (1) — Clay or shale cinders, minimum weight 90 per cent. of marked capacity of car except that when loaded to cubical or visible capacity, actual weight will apply. Establish on, from Jewettville, N. Y., to Detroit, Mich., 248 cents net ton.

Docket 79198 (2) — Agricultural limestone, unburned in bulk, in open-top cars, carload minimum weight 90 per cent. capacity of car except that when car is loaded to full cubical or visible capacity, actual weight will apply. Establish on, from Lewisburg, O., to Goshen, Ind., 146 cents net ton.

Docket 79170 (2) — Sand (except blast, core, engine, filter, fire or furnace, foundry, glass, grinding or polishing, loam, moulding or silica), and gravel, carload, in open-top cars, minimum weight 90 per cent. of the market capacity of the car, except that when car is loaded to full cubical or visible capacity, actual weight will apply. Establish rates on, from Irving, N. Y., to destination in the state of New York as shown in Exhibit B.

Exhibit B

(Rates in cents per ton of 2000 pounds)

To	Rates
Pepew, Lancaster, Harriet, North Tonawana, N. Y.	$0.77
Wende, Crittenden, Corfu, Batavia, LaSalle, Echcota, Niagara Falls, Suspension Bridge, Bellaircraft, N. Y.	.88

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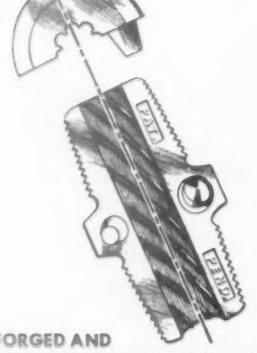

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Chili, Cold Water, Middleport, Medina, Knowlesville, Eagle Harbor, Albion, Elmgrove, Rochester (Kent St.), Appleton, Barker, Millers, Lyndonville, Ashwood, Charlotte, N. Y. 1.10
Francher, Holley, Brockport, Adams Basin, Spencerport, Waterport, Carlton, Brice, West Kendall, Kendall, Morton, Hamlin, Walker, Hilton, Greece, N. Y..... 1.21

Docket IRC 511-339 — Stone, broken, chip, crushed, rip rap, rubble, in open-top cars, from Buncombe, Ill., to stations in Illinois on B.&O., I.C., L.&N., Mo. Ill., M.P., N.Y.C. (C) P.R.R. and Southern Ry., (representative); Washington 139, Sandoval 119, Effingham 132, Kinmundy 124, Maunie 139, Mt. Vernon (L.&N.) 110, Salem 116, Flinton 139, Clores 124, Marshall 139, Norris City 105, being proposed rates. Present—class or combination.

Docket IRC 511-340 — Agricultural limestone, in open-top cars, carload minimum weight 90 per cent. of marked capacity of car, except that when car is loaded to full visible or cubical capacity, actual weight will apply, from Rivermines, Mo., to P.R.R. stations in Illinois:

(Rates in cents per net ton)

To (Representative)	Present	Proposed
Collinsville, Ill.	124	100
Troy, Ill.	132	106
Highland, Ill., Pocahontas, Ill.	132	110
Smithboro, Ill.	132	117
Vandalia, Ill.	132	122
Altamont, Ill.	153	129

Docket IRC 511-343 — Agricultural limestone, carload, from Cordova, Ill., to various stations on C.B.&Q. Railroad in Illinois.

To (Representative)	Present	Proposed
Aledo, Ill. 1.31		97 cents
Alexis, Ill. 1.17		99 cents
Galesburg, Ill. 1.31		99 cents
LaSalle, Ill. 1.53		$1.24
Princeton, Ill. 1.31		1.18
Wyanet, Ill. 1.31		1.11

SOUTHWESTERN FREIGHT BUREAU DOCKET

Docket 37765 (2) — Cement, interstate, to Kansas, Oklahoma and Texas. To reinstate rates on cement, viz.: hydraulic, masonry, mortar, natural or Portland and commodities taking same rates, that were in effect on March 9, 1941, from and to the following points: (1) From Oklahoma producing points to Oklahoma destinations in Scale IV territory—state and interstate. (2) From Kansas producing points to Kansas destinations in Scale IV territory, state and interstate. (3) From interstate producing points to destinations in Kansas, Oklahoma and Texas. (4) From Portland, Colo., to Texas destinations; also to other points in Texas to which the rates were revised effective March 10, 1941, as a result of the revisions to Scale IV territory in Texas.

Docket 37939 (1) — Lime, plaster, etc., in mixed carloads with cement, southwest to Minnesota, North Dakota and South Dakota.

(A) To amend the provisions of Item 185-I, WTL Tariff 132-J, by eliminating "Exceptions 1 and 4;" also amend Item 165-D, WTL Tariff 133-J, by eliminating "Exception 1" therefrom.

(B) To further amend items referred to in paragraph (A) to provide an addi-

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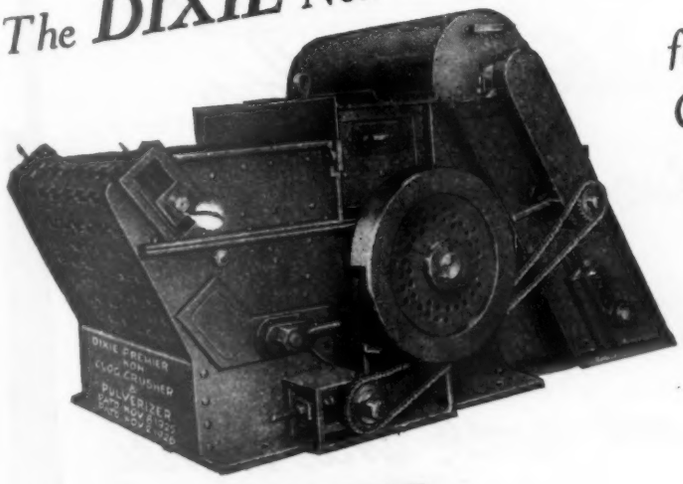

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tional exception reading as follows: Exception—On mixed carload shipments specified above, the provision of Rule 10, Western Classification 71, will not apply.

(C) To cancel Item 370, WTL Tariff 25-F, and other items in agency and individual lines' tariffs in conflict with proposed changes set forth in paragraphs (A) and (B) above.

SOUTHWESTERN FREIGHT BUREAU DOCKET

Docket 38004 (1) Granules, roofing, Copley, O., to Stroud, Okla. To establish rate of $6.18 per ton of 2,000 pounds on roofing granules, carload, from Copley, O., to Stroud, Okla.

Docket 38025 (2) Sand, Ludwig, Mo., to Jackson, Miss. To establish rate of $2.70 per ton of 2,000 pounds on sand, carload, as described in Item 1025-A, SWL Tariff 162-S, from Ludwig, Mo., to Jackson, Miss.

TRANSCONTINENTAL FREIGHT BUREAU APPLICATIONS

Docket 2539 (SRC) — Asphalt, pitch, wallboard (other than plasterboard), in mixed carloads with building or roofing material, WB: Proposal to amend Section 2 of Item 7320, Tariffs 1 and 4, by eliminating the mixed carload entries on "Asphalt" "(Asphaltum)," "Board, wall, other than plasterboard" and "Pitch, other than Montan," permitting Item 795 of those tariffs to govern application of rates on mixed carload shipments.

Docket 2611 (shipper) — Common lime, including magnesium lime, hydrated, quick or slaked, carload. Request for rate, 56 cents per 100 pounds minimum weight 60,000 pounds, from Sallisaw, Okla., (Group E-1) to North Pacific Coast Territory, Tariff 4.

TRUNK LINE ASSOCIATION DOCKET

Docket 43167 (shippers) — Plaster and plasterboard (Note 216), as shown in Item 2955 of Agent Curlett's Commodity Tariff 23-N, I.C.C. No. A-823, carload minimum weight 40,000 pounds from Akron, Clarence Center, Oakfield, Garbutt, Transit, Wheatland and Wheatville, N. Y., to Mount Hope, W. Va., 28¾ cents per 100 pounds on the plaster and 31¾ cents on the plasterboard. Reason: Comparable with rates applying to other points.

Docket 43174 (increases and reductions—carriers) — Limestone, ground or pulverized, minimum weight 60,000 pounds from Grove, Md., to M.&U. R.R. Stations, Pounds Station, Slate Hill, Johnson, West Town Unionville and M.&U. Junction, N. Y., $2.26 per net ton; and from Stephens City, Oranda, Capon Roads, Strasburg Jct., Va., to the same destinations, $2.59 per net ton. Reason: To place rates on recognized basis.

Docket 43176 (shippers) — Limestone, ground or pulverized, carload minimum weight 60,000 pounds from Oriskany Falls, N. Y., to Prattsburgh, N. Y., $2.01 per net ton, in lieu of present sixth class rates. Reason: Comparable with rates applying from and to other points.

Docket 43192 (shippers) — Sand and gravel, as described in exhibit, copy of which will be furnished on request. Minimum weight 90 per cent. of marked capacity of car, etc., to Fort William, Ont., from Albany, N. Y., Group (E), $5.94, and from Berkeley Springs, W. Va., and Mapleton, Pa. Group (A) $6.05 and (B) $6.66. Reason: Comparable with rates applying from and to other points.

Docket 43152 (Supplement 2, shippers) — To establish rate of $4.19 per net ton on slate, crushed or ground; stone, nat-

ural, viz.: Chips or Granules (roofing granules), chips or waste (other than marble chips or waste), from Arvonia, Dutch Gap and Esmont, Va., to Brookville, Ind.

Docket 43212 (increase, carriers) — To amend Item 1895 of Agent Curlett's Tariff I.C.C. No. A-823 publishing rates on limestone, crude, fluxing, foundry and furnace, carloads, from various stations on the P.R.R. to points in Ohio and Pennsylvania, by changing the rate from Bellefonte and Chemical, Pa., to Bridgeville, Pa., to read $1.39 in lieu of $1.36 per gross ton. Reason: To place rate on proper basis.

Docket 43218 (shippers) — Limestone, ground or pulverized, carload minimum weight 60,000 pounds, from Howes Cave, N. Y., to:

	Net ton
Akeley, Russell, Warren, Pa.....	2.70
Atlantic, Cochrane, Conneautville, Conneaut Lake, Center Road, Dicksonburg, Espyville, Hartstown, Linesville, Meadsville, Springboro, Westford, West Vernon, Pa.....	3.03
Bear Lake, Colza, Garland, Lottsville, Pittsfield, Sheffield, Tidioute, Union City,, Youngsville, Pa.....	2.81
Cambridge Springs, Saegertown, Titusville, Venango, Pa.....	2.92

In lieu of current 6th class rates. Reason: Comparable with rates from and to other points.

WESTERN TRUNK LINE NEW APPLICATIONS

Docket E-41-707 — Limestone, crushed or ground, carload to Colorado, Kansas and Nebraska stations. Proposed — To cancel present rates from Columbia, Mo., published in Item 3830-A of Western Trunk Line Tariff 18-R. Agent Kipp's I.C.C. No. A-3549.

Docket E-41-708 — Sand, gravel and crushed stone, between points in Iowa. Rates: Proposed — To provide a restriction in WTL Tariff 160 series, restricting the truck compelled rates on sand, gravel and crushed stone so that the 80 per cent. rates may not be used in the construction of through rates where the total distance from point of origin to final destination exceeds 150 miles.

Docket X-E-41-709 — Agricultural limestone (for soil treatment), carload minimum weight 90 per cent. of the marked capacity of car, but not less than 40,000 pounds from Alden, Ia., Cedar Rapids, Ia., LeGrand Limestone Company's pit located 2.22 miles from Quarry, Ia., Mason City, Ia., to C.&N.W. Ry. stations in Iowa, for distances of 161 miles to 230 miles inclusive. Proposed — $1 per net ton (Note[2]). (By shipper).

Note[2]—To expire with Dec. 31, 1946.

Docket E-41-711 — Sand, as described in Item 25, WTL Tariff Number 41-A, carload minimum weight as provided in WTL tariff 41-A, from Chippewa Falls and Eau Claire, Wis., to Muskegon, Mich. Proposed — in cents per ton of 2,000 pounds—Column A-264; column B, 290; column C, 264, (By shipper).

WESTERN TRUNK LINE NEW APPLICATIONS

Docket E-41-712 — Sand, asbestos; sand, not otherwise indexed by name; sand pit strippings and sand, silica; from Festus, Crystal City and Sand Pit, Mo., to points in Colorado, common points as per Item 8070. Western Trunk Line Tariff 111-M. Proposed — Amend Item 8070 Western Trunk Line Tariff 111-M and include Festus, Crystal City and Sand Pit, Mo., as origins at a rate of 38 cents per 100 pounds. (By shipper).

ILLINOIS FREIGHT ASSOCIATION DOCKET

Docket IRC 511-344 — Sand (except naturally bonded moulding and ground or pulverized) in closed equipment and also in open-top equipment, carload, from Dune Park and Millers, Ind., to Keokuk, Ia.:

In closed equipment
Present .....209 cents
Proposed .....231 cents
In open-top equipment
Present .....187 cents
Proposed .....220 cents

NEW ENGLAND FREIGHT ASSOCIATION DOCKET

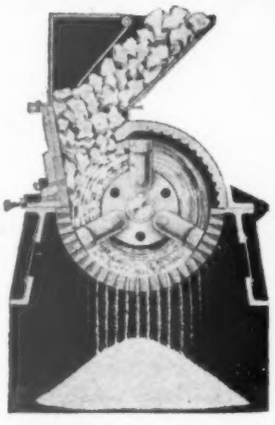
Docket 65571 (2-R) — To establish rate on stone, crushed, carload minimum weight 50 tons of 2,000 pounds, except that when cars of lower capacity are furnished for carriers' convenience, the carload minimum weight will be the marked capacity of car from Greenfield, Mass., to Baldwinville, Mass. Present—77 cents net ton Proposed 70 cents net ton. Reason: To establish commodity rate comparable with other commodity rates now in effect.

DOCKET AND STATUS REPORT OF PRIOR SOUTHERN FREIGHT ASSOCIATION SUBMITTALS

Docket 34106 (shipper; suggested by carrier) — Establish rate 460 cents ton, 2,000 pounds, gypsum, crude or crushed (not ground), in bulk, carload 80,000 pounds. Highland and Murfreesboro, Ark., to Knoxville, Tenn.

Docket 34108 (shipper; suggested by carrier) — Establish joint through commodity rate moulding sand, carload (Item 517, SFTB FT 388-F, ICC 840), Lexington, Tenn., to Traverse City, Mich., 429 cents ton, 2,000 pounds.

GRUENDLER CRAFTSMANSHIP SERVING INDUSTRY 61 YEARS



Cut-a-way view of Gruendler Pulverizer

...In 1946 GRUENDLER will be 100% prepared to handle one of the Largest Demands for Crushers than ever before

You will be interested to know that our war effort included the production of over several hundred PORTABLE ROCK CRUSHING PLANTS for air-port runways and highways throughout the European and Pacific Areas... almost one hundred LARGE PLASTIC MIXERS for the manufacture of armor plastic on various ships . . . the construction of approximately five hundred REFUSE and GARBAGE GRINDING UNITS for Combat Ships . . . also thirty-five Complete CRUSHING PLANTS for the Sea Bees.

In addition GRUENDLER served a great War Food Program, accomplished through high priorities, manufactured over one hundred seventy-five LIMESTONE PULVERIZERS to give a production of over six million tons of Agricultural limetsone a year. So important was the program, that Government statistics have proven an outstanding agricultural accomplishment.

The sectional view of the Limestone Pulverizer, shown above, is the most popular type giving large production at an economical cost for operation.

The limestone program will be extended for many years based on the outstanding results. If you are considering Gruendler Equipment in your budget for 1946, we sincerely urge that you place your order as early as possible.

LIMESTONE PULVERIZERS range from sizes of 3 tons per hour to 75 and 100 tons per hour. Our Engineering Department will assist you in the preparation and layout of your plant equipment.

Manufacturers of ROCK and GRAVEL, CRUSHING, SCREENING, and CONVEYING EQUIPMENT, both Stationary and Portable.

WRITE FOR ILLUSTRATED BULLETINS and DATA

GRUENDLER

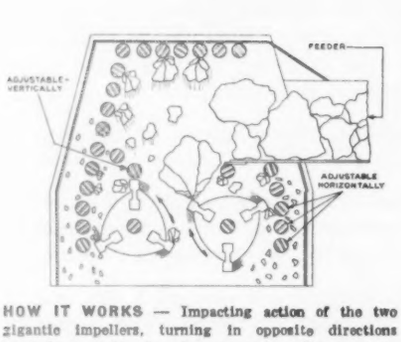
CRUSHER and PULVERIZER CO. • ST. LOUIS 6, MISSOURI

NEW HOLLAND Impact Primary Crusher

Doubles Agstone Output

...right from the start!

Side View of No. 3030 Crusher with detachable Reciprocating Feeder operating in McCorkle Stone Company plant, Milroy, Indiana.



HOW IT WORKS — Impacting action of the two gigantic impellers, turning in opposite directions away from each other (see arrows) strike stone in mid-air as it is fed into crusher. Material is thrown upward against grate bars and rebounds until reduced to required size. It then passes around impellers and out through discharge openings. Impellers travel at adjustable speeds of 250 to 1000 rpm. The size of finished product is easily and quickly controlled. Manganese steel impeller bars have four striking faces and may be reversed when worn.

Write Dept. J3 for complete details.

Sensational results in limestone reduction are reported by the McCorkle Stone Company of Milroy, Indiana, with their recently installed New Holland Model 3030 Double Impeller Impact Crusher.

In addition to increasing agstone output at least 100%, the new crusher produces such perfectly cubed material that the secondary crushers in the plant have considerably boosted capacities.

The New Holland unit is so flexible it can operate as a separate plant and so productive the McCorkle Stone Company is installing additional equipment to handle the increased capacity.

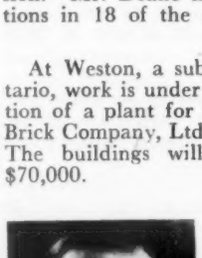
Handling run-of-the-quarry, feed stone ranging up to 30 inches, this New Holland machine is producing 100 tons per hour of minus 1-inch material with only 80 horsepower.

NEW HOLLAND (NH) MACHINE CO.
NEW HOLLAND, PENNSYLVANIA

TRADE NOTES

Horace A. Deane, works manager of the Brake Shoe and Castings Division of American Brake Shoe Company, has been appointed a vice-president of the division. Mr. Deane is in charge of operations in 18 of the company's 57 plants.

At Weston, a suburb of Toronto, Ontario, work is under way on the construction of a plant for the A. P. Green Fire Brick Company, Ltd., a Canadian branch. The buildings will cost approximately $70,000.



W. H. Hammond

W. H. Hammond has been promoted to the newly-created post of vice-president in charge of sales of Gar Wood Industries, Inc., Detroit. Mr. Hammond was formerly sales manager of the hoist and body and tank divisions and director of branches, with the title of vice-president.

In his new position, Mr. Hammond will supervise the sales activities of the winch and crane, road machinery, heating and boat divisions. He will continue as director of branches.

W. A. Yost, Jr. has been appointed assistant manager of the steam turbine department, Allis-Chalmers Manufacturing Co., of Milwaukee, Wisconsin. Formerly in charge of the department's marine division, Mr. Yost will also assume direction of sales of steam turbines and the rapidly developing gas turbine.

Ground was broken recently for a $2,500,000 construction program at the Electro-Alloys Foundry at Elyria, Ohio, a subsidiary of the American Brake Shoe Company. The project will include a completely new alloy foundry, an office building and an employees' building. The new foundry will be more than four times the size of the present one and will take care of production of alloy formerly handled by the American Manganese Steel Division of Chicago Heights, Illinois.

Amsco Alloy and Thermalloy are identical, and when the new buildings are completed, will be produced entirely at Elyria and sold under the name Thermalloy.

On November 14, 1945, F. L. Smidth & Company celebrated its 50th anniversary as engineers and machinery manufacturers, specializing in equipment for the cement, lime and allied industries. The company was incorporated in New Jersey on November 6, 1895, and pioneered in machinery design and processes which have proved of outstanding importance to the cement industry.

The success of this company has been paralleled in other parts of the world by the other Smidth plants in Copenhagen, London and Paris. The American Smidth company is independent of

the European concerns, but until the outbreak of World War II it maintained close technical cooperation with the European Smidth organizations and expects to resume such technical cooperation in the post-war period.

Active officers of the company are: Erik Thune, president; George R. Nielsen and S. G. Thyrre, vice-presidents; A. B. Zahn, secretary, and J. Groeger, treasurer.

Lt.-Comdr. Anthony Anable

Lieutenant Commander Anthony Anable, U. S. Naval Reserve, now on terminal leave, will rejoin the Dorr Company — Engineers of New York, on January 1 as director of public relations and advertising. O. S. Tyson & Company, New York, will continue as advertising agents.

Commander Anable has been on military leave from the Dorr Company since shortly after Pearl Harbor. As navigating officer of an aircraft carrier, he participated in four major naval actions in support of the invasions of Southern France, the Philippines, Iwo Jima and Okinawa. A veteran of World War I, he served in the Navy's Cruiser and Transport Force which, in 1917-18, transported the first American Expeditionary Force to France.

American La France-Foamite Corporation of Elmira, New York, has prepared a series of instruction cards, explaining the operation and maintenance of four types of widely-used hand fire extinguishers. Detailed information is given on the foam, soda-acid, vaporizing liquid and carbon dioxide types. Illustrations are provided to show the correct handling of the extinguishers. The cards will be furnished to plant operators without obligation.

George D. Shaeffer, formerly chief engineer of Gar Wood Industries, Inc., has been elected to the post of vice-president in charge of engineering.

Mr. Shaeffer joined Gar Wood in 1938 as chief engineer of its Road Machinery Division, after having served as chief of the road machinery engineering department for Allis-Chalmers Manufacturing Company for two years.

C. G. A. Schmidt

The appointment of Carl G. A. Schmidt as manager of the New Products Division of Hercules Steel Products Company of Galion, Ohio, was recently announced by E. P. Monroe, secretary of the firm. Mr. Schmidt has specialized in the field of design, application and sales of materials - handling, quarry and construction equipment. He also served as equipment engineer for the Pennsylvania Department of Highways.

As head of the Products Division, Mr. Schmidt will develop and improve units for handling coal and other bulk materials.

Several personnel changes have been announced by the Hewitt Rubber Corporation of Buffalo, New York.

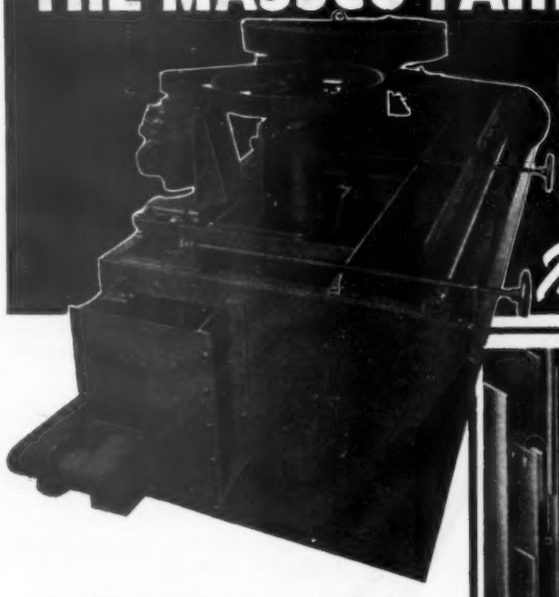
Arthur Purmort, former member of the sales department who served during the war in the production and engineering department, has been moved to St. Louis as district sales manager, supervising territories in Missouri, Indiana, central Ohio, southern Illinois and Kentucky.

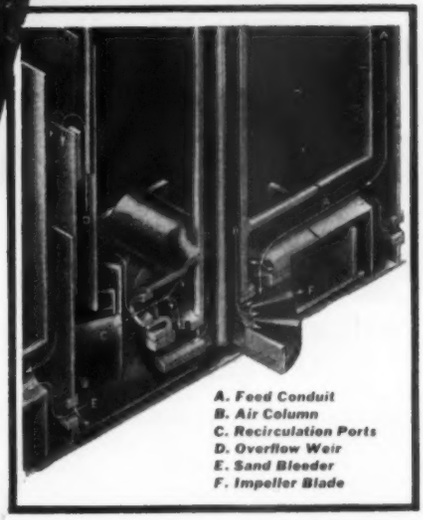
William E. McCue, who served during the war in the purchasing department and became traffic manager last February, has joined the sales department and is covering the Cleveland and northern Ohio territory.

Robert Crane, who has been in the Buffalo sales office for a number of years, has been shifted to the Indiana territory, making his headquarters in Indianapolis.

Fred H. Haggerson, president of the Union Carbide & Carbon Corporation, announced the election by the board of directors the following officers: Dr. J. G. Davidson, vice-president, Chemicals Division; S. B. Kirk, vice-president, Industrial Gases Division; J. W. McLaughlin, vice-president, Plastics Division; W. J. Priestly, vice-president, Alloys and Metals Division; J. H. Rodger, vice-president, Railroad Division; A. V. Wilker, vice-president, Carbon Division;

THE MASSCO FAHRENWALD
a new FLOTATION MACHINE
embodying basic Improvements





A. Feed Conduit
B. Air Column
C. Recirculation Ports
D. Overflow Weir
E. Sand Bleeder
F. Impeller Blade

The Massco-Fahrenwald Machine was designed by Dr. A. W. Fahrenwald, dean of the School of mines, University of Idaho. As mining men well know, Dr. Fahrenwald is one of the world's topmost authorities on flotation.

The cut - away drawing at the right explains how air and pulp are introduced separately to the impeller, instead of together.

The advantages of this new machine are: (1) Greatly increased aeration; (2) More air per unit of power input; (3) Better diffusion and more uniform distribution of air; (4) Remarkable ability to increase aeration with feed overloads; (5) Easier servicing of machines; (6) Increased life of parts.

● For data and more complete description of this machine ask for our new flotation folder just off the press.

Main Office: Denver, Colorado, U. S. A.
El Paso, Salt Lake City
1775 Broadway, New York

Canadian Vickers, Ltd., Montreal
W. R. Judson, Santiago and Lima

Genuine Wilfley Tables; Massco-McCarthy Hot Millers; Rock Bit Grinders; Density Controllers; Belt Feeders; Pinch Valves; ASSAY AND LABORATORY SUPPLIES AND EQUIPMENT; COMPLETE MILLING PLANTS.

The Mine & Smelter Supply Co.

PERFORATED METAL SCREENS

FOR SAND, GRAVEL STONE, ETC.

Manufactured exactly to your specifications.

Any size or style screen, in thickness of steel wanted with any size perforation desired.
We can promptly duplicate your present screens at lowest prices.

Prompt shipment

CHICAGO PERFORATING CO.
2435 W. 24TH PLACE CHICAGO, ILL.
Telephone CANAL 1459

STRONG LINKS

in the "HIGH PRODUCTION CHAIN"

MERRICK SCALES

. . . help to establish production records by providing precision and speed in weighing bulk materials handled on belt conveyors.

These time-saving, reliable, and durable machines are in world-wide use —many of them are still in active service after daily operation for more than 30 years.

Link up production and profits with MERRICK SCALES.

WEIGHTOMETER

. . . supplies a continuous, automatic and accurate weight record while material is in transit. Easily installed. Low operating and maintenance costs.

FEEDOWEIGHT

. . . automatically weighs, totals and records the amount of material fed. Also correctly proportions two or more materials in continuous or batch feeding.

Write for Bulletins

MERRICK SCALE MFG. CO., Passaic, N. J.

H. E. Thompson, vice-president, Engineering; R. J. Hoffman, vice-president, Industrial Relations; and M. G. Dial, secretary-treasurer.

Dr. Davidson is president of the Carbide & Carbon Chemicals Corporation; Mr. Kirk, of the Linde Air Products Company; Mr. McLaughlin, of the Bakelite Corporation; Mr. Priestly, of the Electro Metallurgical Company; Mr. Rodger, of the Oxweld Railroad Service Company; Mr. Wilker, of the National Carbon Company, Inc.; Mr. Hoffman, of the Union Carbide & Carbon Research Laboratories, Inc. Mr. Thompson is vice-president and director of Carbide & Carbon Chemicals Corporation and the Bakelite Corporation; and Mr. Dial is secretary-treasurer of many of these subsidiary companies.

H. P. Valentine

The appointment of Lt. Col. H. P. Valentine as manager of Mack dealer sales and operations has been announced by A. C. Fetzer, vice-president of Mack-International Motor Truck Corporation.

Colonel Valentine comes to the Mack organization after service in the War Department, where he was chief of the Transport and Automotive Branch, production Division Headquarters, Army Service forces, with staff responsibility for the army's huge war production of automotive, shipbuilding, construction machinery and railway equipment. Prior to his war service, he was with the Chrysler Corporation for 11 years in key executive positions. Colonel Valentine will make his headquarters in the Mack general offices in New York's Empire State building.

To meet the greatly expanded needs for packaging in Southern California, the Bemis Brothers Bag Company is increasing its production of cotton, burlap and open-mesh bags by opening a factory at Los Angeles.

A building just being vacated by the Consolidated Vultee Aircraft Corporation has been leased in Los Angeles. A spur track is being built to permit direct unloading of supplies and shipment of finished products.

The following distributors are now handling the Blue Brute line of mixers and pavers for the Ransome Machinery Company of Holyoke, Massachusetts.

Thomas G. Abrams, Dearborn, Michigan; Allied Equipment, Inc., Miami, Florida; the Coast Equipment Company, San Francisco; and the Lakeshore Machinery & Supply Company, Muskegon, Michigan.

E. W. LaPlant, co-founder of LaPlant-Choate Manufacturing Company, Inc., of Cedar Rapids, Iowa, died on December 4 after a long illness. His passing ended one of the most colorful careers in the construction equipment industry.

Starting in the house-moving business in 1889, he developed unusual equipment and techniques for blocks of buildings and even entire towns. In

1912 he engaged his nephew, Roy E. Choate, as a partner, and in 1927 the partnership became a corporation. Later LaPlant-Choate began the manufacture of earth-moving equipment — wagons, scrapers, dozers and other machinery. Although he had been inactive in the business since 1927, Mr. LaPlant continued as a director of the corporation until 1944.

C. B. Smythe

C. B. Smythe of Elyria, Ohio, was elected president of the Thew Shovel Company of Lorain, Ohio, on November 30. Mr. C. B. Smythe will succeed his father, F. A. Smythe, who died on November 8, after serving 46 years as the first and only president of the company.

Mr. Smythe joined the Thew Shovel Company in 1910 and was elected vice-president in 1920. He is director of the Highways Industries Association (affiliated with the American Road Builders' Association) and a director of the Power Crane and Shovel Association.

The Central District of the Manhattan Rubber Division, Raybestos-Manhattan, Inc., formerly called the Pittsburgh Branch, has been expanded to include a large portion of Ohio, the eastern panhandle of West Virginia and several counties of Maryland. R. C. Rice is manager of the Central District. John B. Anderson, formerly Manhattan Rubber division representative in southern and western Pennsylvania, is assistant manager, succeeding the late Stanley J. Waechter.

Joseph Hoffman will represent the company in southern Pennsylvania and northern West Virginia.

To fill a position created by the company's expansion, Gerald J. Slade has been appointed advertising manager of Hewitt Rubber Corporation, officials have announced. For the past two years Mr. Slade has been with the B. F. Goodrich Company in Akron, where his principal responsibilities were merchandising research and advertising media analysis. Previously he was assistant to the chief of the Tire Rationing Branch in Washington.

Commander George Gellhorn, who left Worthington Pump & Machinery Corporation on January 1, 1942 for active duty in the U. S. Navy, has been released to inactive status and has returned to resume his position as export manager, with offices at Worthington's Harrison Works.

Before receiving his orders to report for active duty, Mr. Gellhorn had been in the service of Worthington Pump & Machinery Corporation for over 11 years.

The appointment of Carl F. Schober and Captain Kenneth F. Ames to the central sales division of Caterpillar Tractor Company has been announced by J. J. Valentine, central sales division manager of the company.

Mr. Schober, who will serve as district representative in Texas and New Mexico, joined Caterpillar in 1941 as a

C. F. Schober

Capt. Ames

member of the treasury department and was later assigned to the company's Washington, D. C., office to assist in various wartime activities. He was transferred to central sales in August, 1945.

Captain Ames returns to the central sales division as a district representative in Montana, North Dakota, Saskatchewan and Alberta after more than four years in the service.

In a dramatic test-feat at Niagara Falls, the Bemis Brothers Bag Company of St. Louis, Missouri, demonstrated the extreme durability of their product. Three 50-pound flour-filled Bemis paper bags were started down the falls by William (Red) Hill, who went over the brink in a barrel on July 8, 1945.

The bags traversed the churning rapids, descended Horseshoe Falls (170 feet) and landed on the rocks below, to be pounded by tons of water. When they

IT COSTS NO MORE TO USE THE BEST

REPLACE WITH "Indian Brand"

Shovel Dippers
Dipper Teeth
Shovel Treads

Crusher Jaw Plates
Mantles—Concaves
Bowl Liners
Roll Shells

Pulverizer Hammers
Grate Bars—Breaker Plates

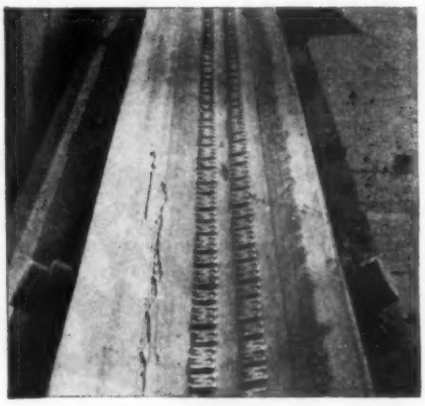
Ball Mill Liners
Screen Plates

The Frog, Switch & Mfg. Co. CARLISLE, PA.

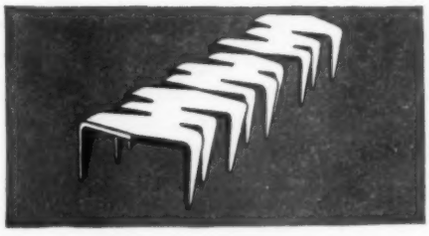
ESTABLISHED 1881

CONVEYOR BELTS

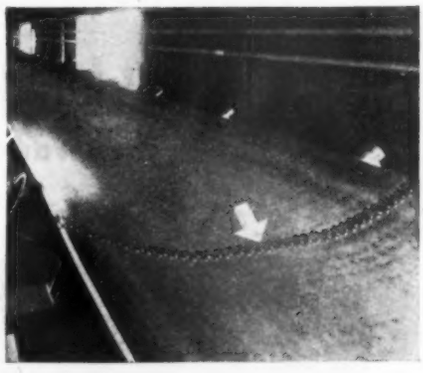
fastened or repaired ON THE JOB in a few minutes



All you need are hammer, block of wood and . . . .



BRISTOL'S BELT LACING



For rubber or woven conveyor belts up to 13/16" thick.
Write for Bulletin 736.

THE BRISTOL COMPANY
Mill Supply Division
137 Bristol Road, Waterbury 91, Conn.
DISTRIBUTORS EVERYWHERE

PULVERIZERS

Hundreds of Installations . . Use Bradley Pulverizers

for the reduction of

AGRICULTURAL LIMESTONE

Cement Materials and all Dry, Non-Metallic Minerals

CAPACITIES: 1 TO 50 TONS PER HOUR
FINENESSES: 20 TO 350 MESH

BRADLEY PULVERIZER CO.

ALLENTOWN, PENNA.

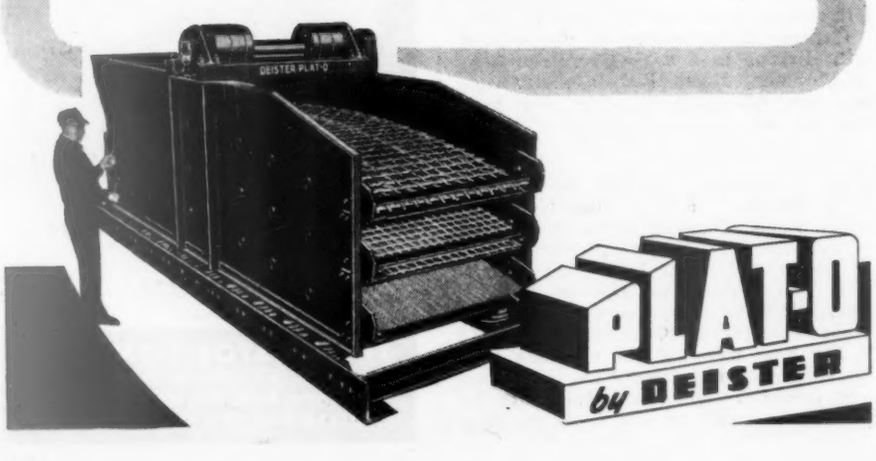
Faster
More Accurate

The combination that means higher profits—faster grading and more accurate sizing, *plus* proved dependability—is yours in the Plat-O Vibrating Screen. Extreme sizes pass through quickly . . . oversizes bounce off rapidly . . . near mesh sizes stay on the screen longer . . . as a result of Plat-O's powerful, positive high speed, its adjustable opposed elliptical throw, and its forward conveying action at a relatively flat screen angle.

For your toughest screening operations, why not specify Plat-O Vibrating Screens? One, two, three and four-deck models, ranging in size (actual screening area) from 2½′ x 4′ to 5′ x 12′. Write today for details.

DEISTER MACHINE COMPANY

Fort Wayne 4, Indiana



were recovered several hours later, they were almost intact with only the outer coverings affected by the water and rough treatment.

The latest firm to become a franchised distributor for Briggs Clarifier Company of Washington, D. C., and Bethesda, Maryland, is the Equipment Supply Company of Salt Lake City. The firm will serve as distributor for Briggs industrial oil filtration products in Utah; in Unita County, Wyoming; in the southern half of Idaho; and a portion of eastern Nevada.

Briggs has also announced the appointment of the Curtis Engine & Equipment Company of Baltimore as marine products distributor for the Chesapeake Bay area.

B. S. Dowd

At a special meeting of the Vulcan Iron Works board of directors at Wilkes-Barre, Pennsylvania, on December 18, 1945, Benjamin S. Dowd was elected president and general manager.

The accession of Mr. Dowd to the presidency marks another forward step in the development of a vigorous program for post-war expansion made necessary by a world-wide demand for the company's products—particularly from Argentina, Brazil, Mexico and other Latin American countries. Mr. Dowd, in his former capacity as executive vice-president, visited the southern republics and established important sales connections.

In view of the large volume of electric motor business, the Motor Division of General Electric's Apparatus Department is now separated into four divisions and one section.

W. H. Henry, formerly manager of the Motor Division, has been appointed assistant manager of the Industrial Divisions in charge of the motor business. The following division managers have been appointed: A. W. Bartling, Fractional Horsepower Motor Division; Elliott Harrington, Induction Motor Division; J. T. Farrell, D.C. Motor Division; and P. A. McTerney, Synchronous, Large D.C., and Gear-motor Division.

E. J. Schwanhauser, vice-president of Worthington Pump & Machinery Corporation, was elected president of the Diesel Engine Manufacturers Association at the association's annual meeting, held December 11 in Chicago.

Gordon Lefebvre, president of Cooper-Bessemer Corporation, and J. E. Peterson, vice-president of General Machinery Corporation, were elected vice-presidents of the association. Re-elected as treasurer was Robert H. Morse, Jr., vice-president and general sales manager of Fairbanks, Morse & Company.

The International Harvester Company has announced the purchase of a new factory to be known as "Melrose Park Works." This plant, formerly operated by Buick Division of General Motors in the manufacture of Pratt & Whitney Aircraft engines, is located at Melrose

Park, Illinois, a suburb of Chicago. The purchase includes about 135 acres of land and modern manufacturing and office buildings, with approximately 2,000,000 square feet of floor area.

The Mixermobile Sales Company of Southern California has been formed by Jack Beynon of the Bronson Equipment Company at Alhambra, California, to handle the sale of Mixermobile products in southern California. This area was formerly served by Burke Long from his Los Angeles office. Mr. Long will concentrate on sales of Mixermobile, Scoopmobile, Buggymobile and allied equipment in the 37 Eastern states in the future. An assembly plant and office is to be opened in the Middle West within a few months.

C. C. Gerow

C. C. Gerow, first director of sales for Hercules Powder Company, is retiring after more than 47 years in the explosives industry.

Mr. Gerow was one of the first three men employed by Hercules when the company was formed in October, 1912. He began his career in the explosives industry in 1898, when he joined the Laflin & Rand Powder Company as a clerk in the New York office. He served as chief clerk of the contractors' division for the Du Pont Company after the latter had acquired Laflin & Rand. At Hercules he was successively assistant to the vice-president in charge of sales, sales manager of the company and director of sales of the explosives department.

Howard R. Ryan, general sales manager for Economy Pumps, Inc., Hamilton, Ohio, has announced the appointment of E. E. Baker as manager of the distributor sales division. Mr. Baker appointed the Aetna Engineering Company as distributors for Economy Pumps throughout New England.

John G. Barta was recently named manager of the Allis-Chalmers Duluth, Minnesota, branch sales office, to succeed W. H. Knight, who resigned. Mr. Barta was formerly in the Milwaukee district office.

Copies of a four-page leaflet *Crime Does Not Pay*, distributed to its employees in the campaign for good housekeeping by the B. F. Goodrich Company, Akron, Ohio, are available upon request to the company. The leaflet stresses the objectives of the campaign, gives definite rules for handling various materials and equipment, and pictures some "before" and "after" situations.

The Smith Booth Usher Company of Los Angeles, announces the appointment of Alex Kostyzak as general manager of the Construction Equipment Division of that firm. This company is a distributor of construction and industrial equipment, operating in Southern California, Arizona and southern Nevada.

FAST, CHEAP MATERIAL HANDLING

WITH SAUERMAN CRESCENT SCRAPERS

ECONOMICAL STOCKPILING

Picture shows how one-man Sauerman Scraper System handling a 25,000-ton stockpile of phosphate rock at Florida drying plant. Operation is changed quickly from storing to reclaiming. Operating cost about 3c a ton handled.

CRESCENT SCRAPER BUCKET

Exclusive feature of Sauerman Scraper Machine is Crescent bucket which handles large loads faster and with less line-pull than any other scraper.

THREE main economies are assured by using Sauerman Scraper Machines for long haul work such as moving loose materials out of pits or ponds, stripping, stockpiling, bank excavation, etc. These economies are:

(1) Digging, hauling and automatic dumping are merged into a continuous, rapid operation controlled by one operator.

(2) Power requirement is moderate.

(3) Maintenance is simple.

Sauerman machines offer handling capacities from 10 to 1,000 tons per hour and operating spans from 200 to 1500 ft. Specifications of the various sizes and types of machines, together with illustrations of their uses are given in the Sauerman catalogs. Write for this literature today.

SAUERMAN BROS., INC.
534 S. Clinton St., Chicago 7, Ill.

Use 5 to 10 detachable DUMP BUCKETS

Only 15 Seconds to Load or Dump

Cut your Quarrying Costs with

BROOKS LOAD LUGGER

Get set for 1946 with Brooks Load Luggers, mounted on your trucks. Hundreds of quarries like the one shown above are using Brooks System of detachable dump buckets and hoisting unit for hauling rock, feeding crushers, loading riprap on cars, stripping overburden, moving stock piles. Saves time, conserves equipment, makes work easier for men, as buckets are loaded at ground level.

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GILSON MECHANICAL TESTING SCREEN

Prepare for post war competition with this modern testing equipment. Operation is smooth and quiet. Separates accurately up to one cubic foot of concrete aggregate in five minutes or less. An attachment is available for vibrating standard sand sieves. Write for complete information.

THE GILSON SCREEN CO.
P. O. BOX 186 MERCER, PA.

R. P. McKenrick

R. P. McKenrick has been appointed manager of construction equipment of the Blaw-Knox Division of the Blaw-Knox Company, Pittsburgh, Pennsylvania. Mr. McKenrick has for ten years been in charge of construction equipment sales in the Midwestern states.

During the war he was project manager in charge of construction of the huge synthetic rubber plant built by the Blaw-Knox Company for the B. F. Goodrich Company, Louisville, Kentucky.

The Joy Manufacturing Company recently announced that it had acquired the La-Del Conveyor & Manufacturing Company of New Philadelphia, Ohio, which eventually will become the La-Del Division of Joy.

A. L. Schwab will be La-Del's general manager and chief executive of the new division.

William P. Witherow, president of the Blaw-Knox Company of Pittsburgh, was one of the speakers at the recent 50th anniversary congress of the National Association of Manufacturers held in December at the Waldorf-Astoria Hotel in New York.

The Link-Belt Company of Chicago has announced that Joseph W. Sears, heretofore district sales engineer at the Link-Belt plant in Dallas, has been appointed district sales manager, with headquarters in Houston.

The appointment of Stuart Penick as district sales engineer at Dallas was also announced. He fills the vacancy created by Mr. Sears' transfer to Houston.

The Ajax Flexible Coupling Company, Inc., Westfield, New York, announces the appointment of R. R. Bauman as its Chicago area sales representative. Mr. Bauman will have office quarters in Chicago.

The Briggs Clarifier Company, which manufactures specially engineered oil filtration equipment, now has centered all of its offices and laboratories in two modern company-secured plants on River Road and the Baltimore & Ohio tracks in Bethesda, Maryland. Located on nearly 8 acres of ground fronting on River Road, these new plants cover 167,000 square feet.

E. D. Connell, manager of the merchant iron and steel department of Iron & Steel Products, Inc., of Chicago, was elected vice-president on December 1.

Two new appointments in the explosive department of the Hercules Powder Company of Wilmington, Delaware, recently were announced. LeRoy Keane, former manager of the Pittsburgh office, is now director of sales for the explosives department, succeeding C. C. Gerow.

J. Joseph Kelleher has been named manager of the contractors' division, explosive department.

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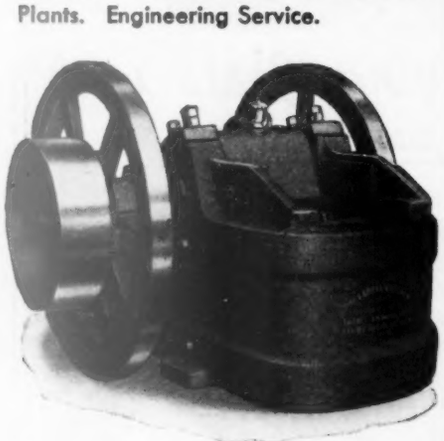
CRUSHERS

Complete plants designed and equipped, including Screens, Elevators and Conveyors. Machinery for Mines and Rock Quarries, Sand and Gravel Plants. Engineering Service.



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KILL PROFITS

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KILN ENDS

. . . prevent costly burn-outs and shutdowns that result in serious loss of production.

Install PYRASTEEL Segmental Kiln Ends at *both* the discharge and feed ends of your cement kilns, and be assured of long, dependable, and economical service.

Write for Bulletin of This Heat-Resisting Alloy

Showing discharge end of cement kiln fitted with PYRASTEEL Segmental Kiln Ends.

Unit segments are easy to install or replace.

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PYRASTEEL for high temperatures

KEDZIE AVE & 37TH ST.
CHICAGO 32, ILL.
Makers of Alloy Steel for 30 Years

EVANSTEEL for strength

Trade Literature

The pieces of literature listed below can be obtained direct from the manufacturers named, or requests can be addressed to Pit and Quarry's "Service to Readers" Department.

MANUAL FOR USING DAREX AEA. 18 pages. Dewey & Almy Chemical Company, Cambridge 40, Massachusetts.

IT'S "CONTROLLED AIR." 8 pages. Form 96-45-2. Dewey & Almy Chemical Company, Cambridge 40, Massachusetts.

TOURNAROPE WALL CHART. Form N-104. R. G. LeTourneau, Inc., Peoria, Illinois.

JOB PROVED—FOR PROFIT. 7 pages. Form G-1068. R. G. LeTourneau, Inc., Peoria, Illinois.

IT PAYS TO BE A CATERPILLAR OWNER. 12 pages. Form 9002. Caterpillar Tractor Company, Peoria, Illinois.

INDUSTRIAL DUST COLLECTOR. 12 pages. Catalog 101. Aerotec Company, White Plains, New York.

DINGS MAGNETIC PULLEYS AND SEPARATORS. 29 pages. Catalog 260. Dings Magnetic Separator Company, Milwaukee, Wisconsin.

DEMING PUMPS EVERYWHERE. 30 pages. The Deming Pump Company, Salem, Ohio.

FACTS YOU SHOULD KNOW ABOUT CENTRIFUGAL PUMPS AND IMPELLERS. 20 pages. Deming Pump Company, Salem, Ohio.

LE-HI HOSE COUPLINGS. 44 pages. Catalog 644. Hose Accessories Company, Philadelphia, Pennsylvania.

CONCRETE TRAILER MIXERS. Jaeger Machine Company, Columbus, Ohio.

UNAFLO OIL-WELL TABLES. 16 pages. Universal Atlas Cement Company, New York, New York.

HOW TO HANDLE IT IF IT IS. Bulletin 462. Chain Belt Company, Milwaukee, Wisconsin.

THE DRAGLINER. 23 pages. Catalog 14. Daniels-Murtaugh Company, Cedar Rapids, Iowa.

HOW TO SAVE MONEY ON INDUSTRIAL HAULING JOBS AND EQUIPMENT. 38 page booklet. B. F. Goodrich Company, Akron, Ohio.

NORDBERG STATIONERY TWO-CYCLE DIESEL ENGINES. 20 pages. Bulletin 122. Nordberg Manufacturing Company, Milwaukee, Wisconsin.

DEVELOPMENTS IN REEVES SPEED CONTROL. 30 pages. Reeves Pulley Company, Columbus, Indiana.

LUBRICATION AND MAINTENANCE GUIDE FOR CONTRACTORS' EQUIPMENT. 72 pages. Gulf Oil Corporation, Pittsburgh, Pennsylvania.

POWER AS YOU LIKE IT. 8 pages. Form 9150. Caterpillar Tractor Company, Peoria, Illinois.

THE ORIGINAL LESSMAN EQUIPMENT. 4 pages. Lessman Manufacturing Company, Des Moines, Iowa.

A-C MAGNETIC REVERSING STARTERS. No. 8910. General Electric Company, Schenectady, New York.

MAXI SUPER HEAVY DUTY TRUCK UNITS. Bulletin SHD-142. Six Wheels, Inc., Los Angeles, California.

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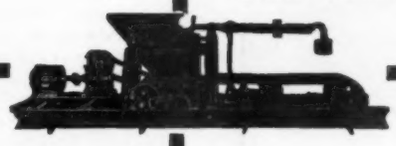
. . . set the pace of production in handling raw and finished materials throughout industry in all parts of the country.
Poidometers combine automatic action, high speed, and accuracy in weighing, mixing, and proportioning raw and finished materials.
These units are finely engineered and durably constructed to insure record output, with high operating economy and product uniformity.

W  E

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BROWNHOIST BUCKETS

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Yes, workers get 4-way safety with this Willson respirator. Protects lungs against 4 different industrial hazards. Metal fumes. Pneumoconiosis-producing dusts. Toxic dusts. Nuisance dusts.

Two double filters provide extra-large filtering area. Give workers the greater comfort of free-and-easy breathing. Filters are throw-away type. May be easily, inexpensively replaced.

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MAXI ON-MAN CRANE CARRIAGE. Two-Axle Type "CU" and Three-Axle Type "CC" Series. Six Wheels, Inc., Los Angeles, California.

MANGANAL — WELDING PRODUCTS PRICE LIST. Stulz-Sickles Company, Newark, New Jersey.

TRANSMISSION BELTING. Catalog 2100. B. F. Goodrich Company, Akron, Ohio.

COLUMBIA SELF-RETAINING NUT and IMPROVED COLUMBIA LOCK NUTS. 2 bulletins. Columbia Nut & Bolt Company, Inc., Bridgeport, Connecticut.

THE STROH PROCESS. 19 pages. Stroh Process Steel Company, Pittsburgh, Pa.

STOODY ALLOYS; COATED STOODY MANGANESE; COATED STOODY 6, AND COATED STOODY 1. 3 Bulletins. Stoody Company, Whittier, California.

CAMBRIDGE WIRE CLOTH, BASKETS, WIRE CONVEYOR BELTS. 4 pages. Bulletin 79. The Cambridge Wire Cloth Company, Cambridge, Maryland.

SPOT CONVEYING. Bulletin FP-1. The Island Equipment Corporation, New York, New York.

MINIT HIGH PRESSURE LUBRICATOR. Form 2155. Balcrank, Inc., Cincinnati, Ohio.

CROCKER - WHEELER SEALEDPOWER MOTORS. 4 pages. Crocker-Wheeler Electric, a Division of Joshua Hendy Iron Works, Ampere, New Jersey.

MAXI SUPER HEAVY DUTY TRUCK UNITS; ONE-MAN CRANE CARRIAGE—TWO-AXLE; ONE-MAN CRANE CARRIAGE THREE AXLE. 3 Bulletins. Six-Wheels, Inc., Los Angeles, California.

THE NELSON INCLINED FURNACE NO. 5. Bulletin 100A. Victor J. Nelson Engineering & Construction Company, Burbank, California.

A LOAD OF SEASONS GREETINGS. Christmas card with movable part illustrating construction of Daybrook truck chassis. Daybrook Hydraulic Corporation, Bowling Green, Ohio.

CHEMICAL ENGINEERING CATALOG, 1945-46. 1708 *pages. Inaugurated in* 1915 *by the American Institute of Chemical Engineers to serve the process industries. Published by the Reinhold Publishing Corporation,* 330 *West* 42*nd Street, New York, New York.* In addition to alphabetical indexes of firms and trade names, classified indexes and manufacturers' catalogs of equipment, supplies, chemicals and materials, this comprehensive volume contains reviews of many technical and scientific books.

AMERICAN HOUSING, PROBLEMS AND PROSPECTS. 466 *pages. Factual findings by Miles L. Colean; program by the Housing Committee. Published by the Twentieth Century Fund in New York, New York. Price,* $3.00. A report on a survey which sought factual answers for the question, "How can we provide better housing in post-war America?" Two major goals: the need to make decent houses available for the mass market; possibilities of creating new jobs by expanding housebuilding.

LESSONS IN ARC WELDING. (*Second edition*). 176 *pages. Published by the Lincoln Electric Company, Cleveland* 1, *Ohio. Price* 50 *cents.*

The series of 61 lessons forms the basis of instruction in the Lincoln Arc Welding School. Lessons 1 to 36 constitute the basic course; 37 to 61, the advanced courses. Copiously illustrated with charts, graphs, sketches and photographs. Each lesson states the object, lists the apparatus and material, and refers to questions and answers.

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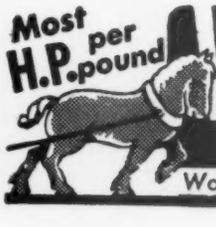

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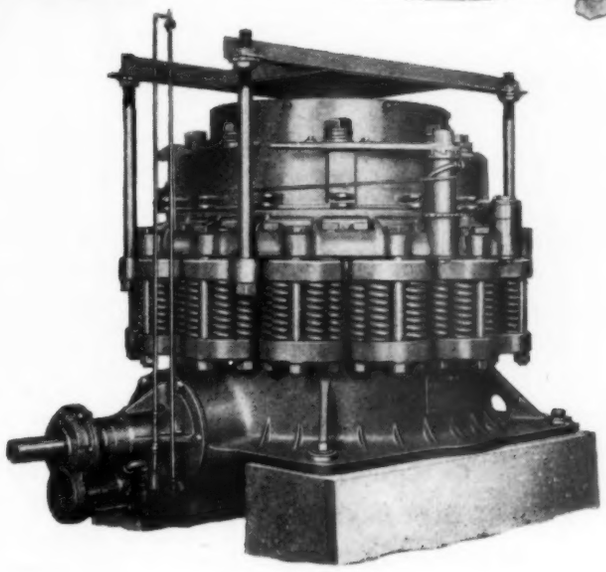

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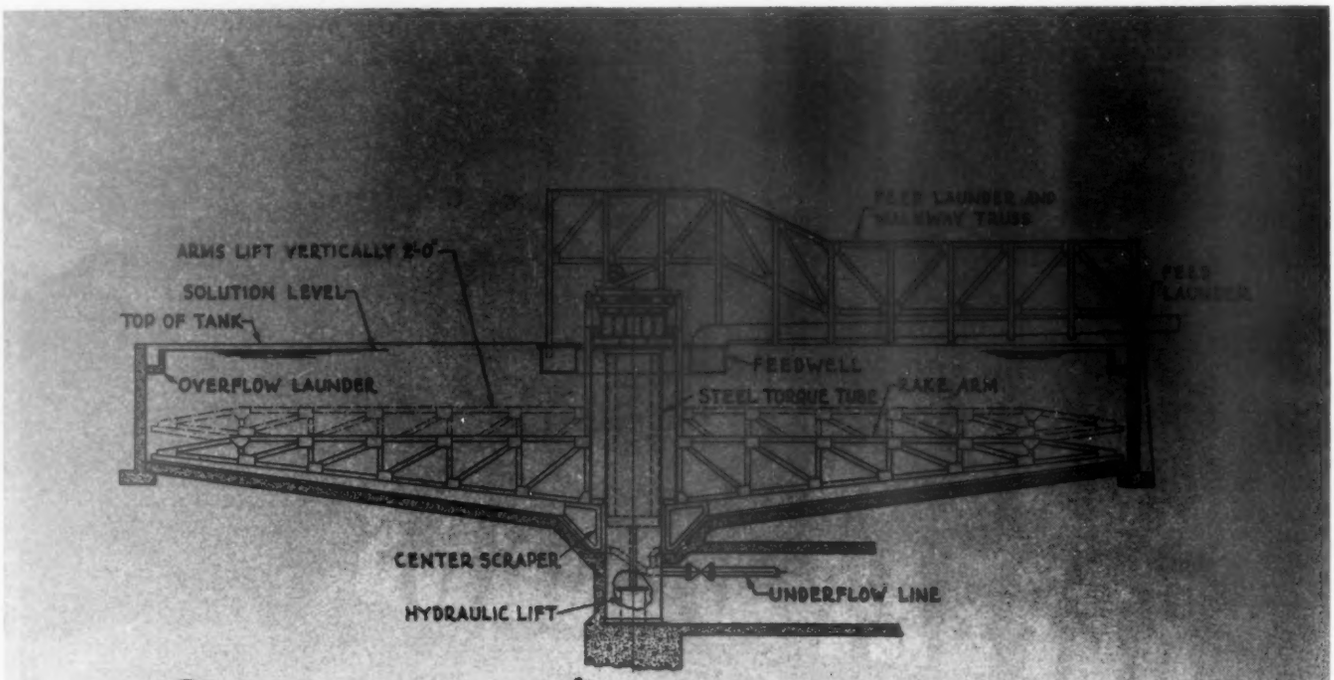

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HIGHER UNDERFLOW DENSITIES due to improved controls and elimination of much of the "human element" formerly required for making adjustments in order to maintain optimum operating conditions.

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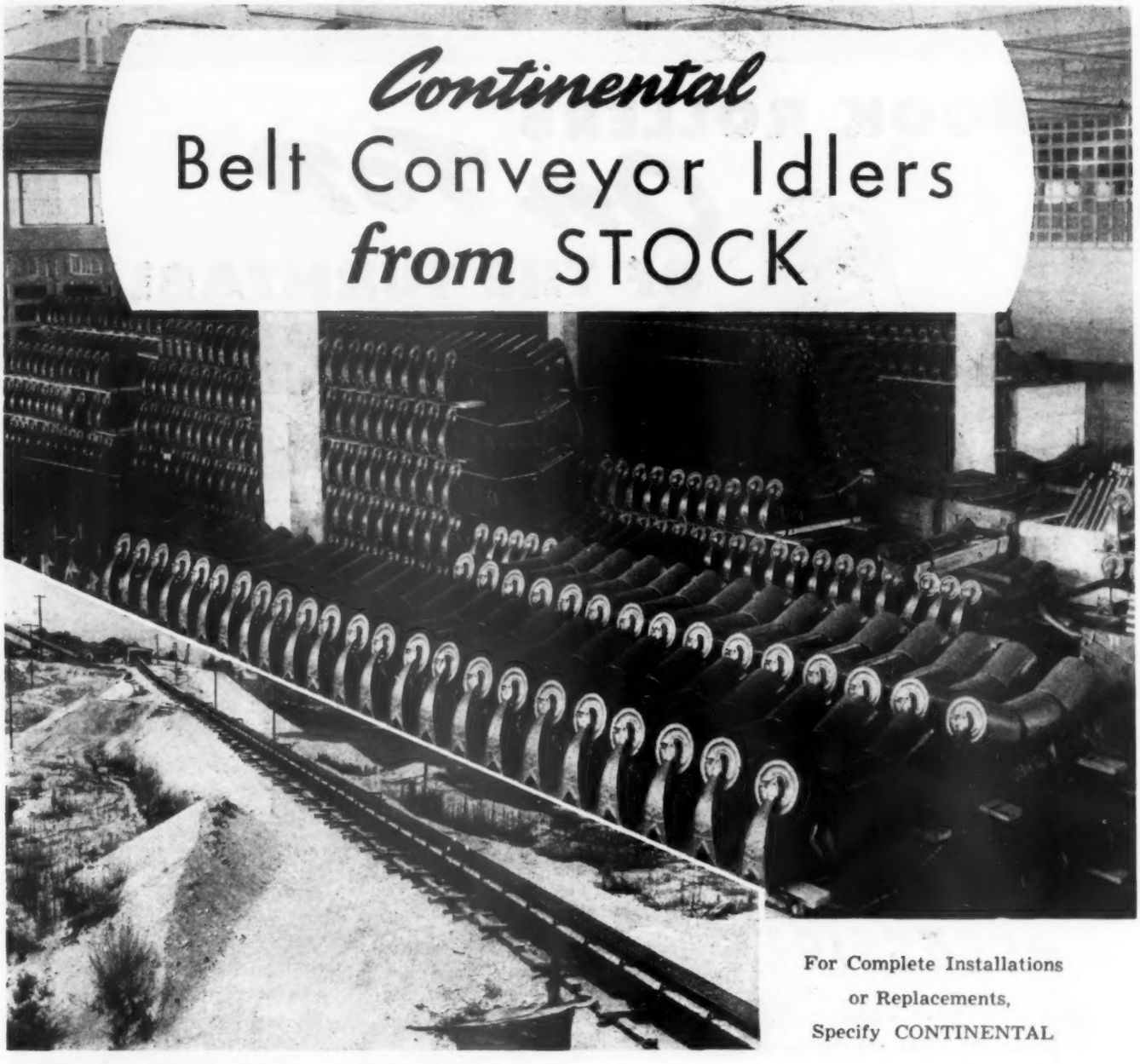

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on Belt Conveyors.

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COMPLETELY ACCESSIBLE

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Located on top of the platform, not down under, the load equalizing hook roller assembly is completely accessible.

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Reduction Ratios: 60 to 1, up to 300 to 1 . . . yet Efficiency as high as 96%

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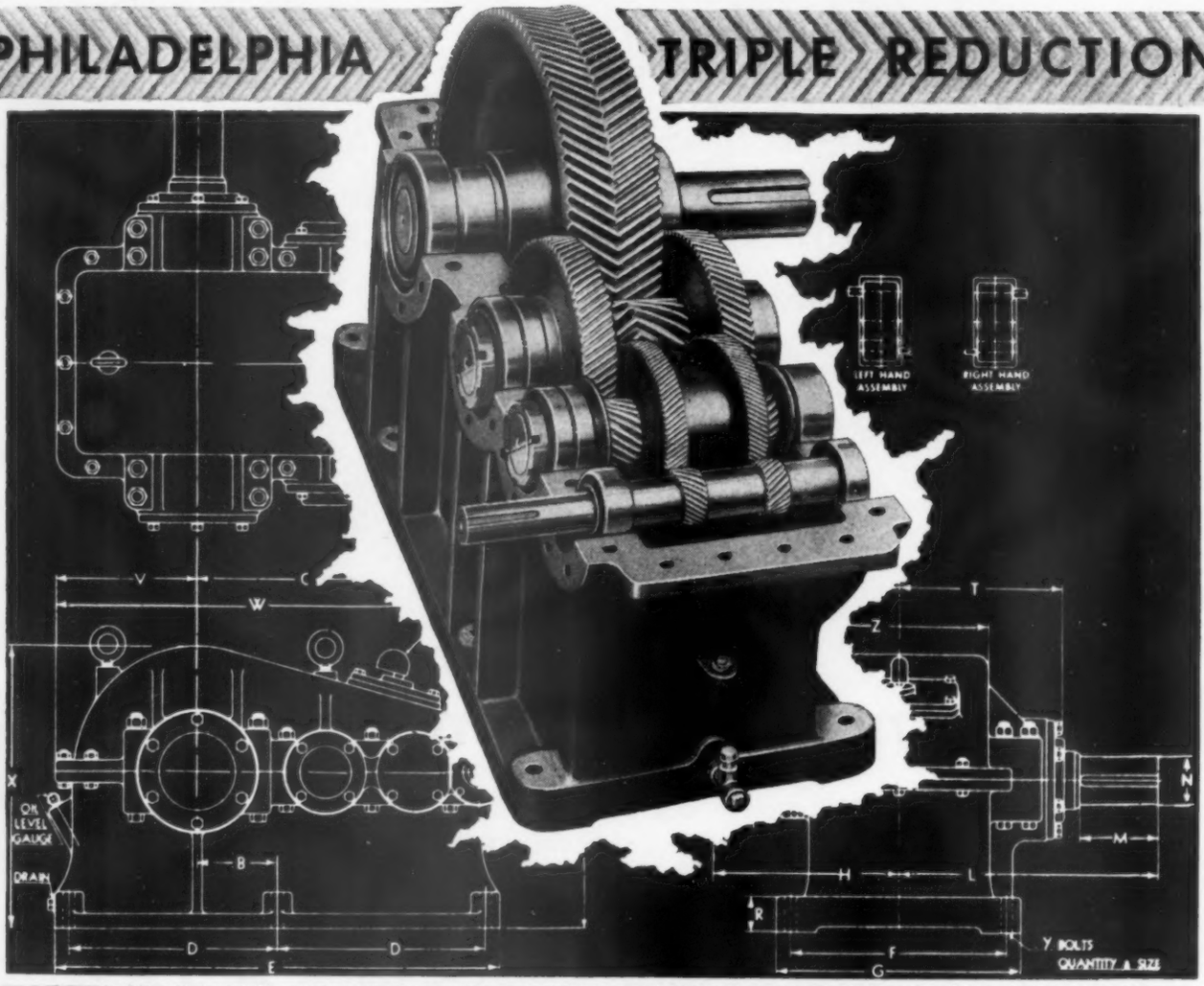

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Why such high efficiencies? Well, because Philadelphia Herringbone Units are the result of careful research and design, they embody the most efficient arrangement of gears, shafts and bearings, and the materials and workmanship entering into their construction are of the very finest.

And too, these Units are available in Single, Double or Triple reductions, to meet the need of every industrial demand for such "shock load drives" as: Crushers, Beaters, Conveyors, Filling Machines, Elevators, Stokers, Mixers, Draw Benches, Kilns, Pulverizers, Screens, Separators, Hoists, Feeders, etc., etc. Of course, all Philadelphia Herringbone Units use the "continuous tooth" design of Herringbone Gears.

Write for our 64 page Catalog #H-39, it tells the whole story and gives all the information needed for specifying, ordering and installing.

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Industrial Gears and Speed Reducers

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"Primacord helps cut our loading and hook-up time."

Every minute counts when you're out on the job. That's one of the big reasons why Plain Primacord-Bickford Detonating Fuse is such a favorite among pit and quarry men.

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P-14

THE ENSIGN-BICKFORD COMPANY • Simsbury, Connecticut

A New Year — full of reasons why Primacord is gaining in popularity.

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ENSIGN-BICKFORD SAFETY FUSE
Since 1836

PRIMACORD-BICKFORD

Detonating • Fuse •

January, 1946

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That was the year when JACKSON & CHURCH began developing time-saving, cost-reducing machinery — which today has become the standard of many industries.

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J&C

CONCRETE BLOCK MACHINES

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which are paced in the concrete brick and block fields by "J&C" machines.

Producers of brick and block can depend on "J&C" units to insure maximum output, product quality, and operating economy.

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Air-Entraining Portland Cement

Makes better concrete at no extra cost...

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- Calls for no additional materials;
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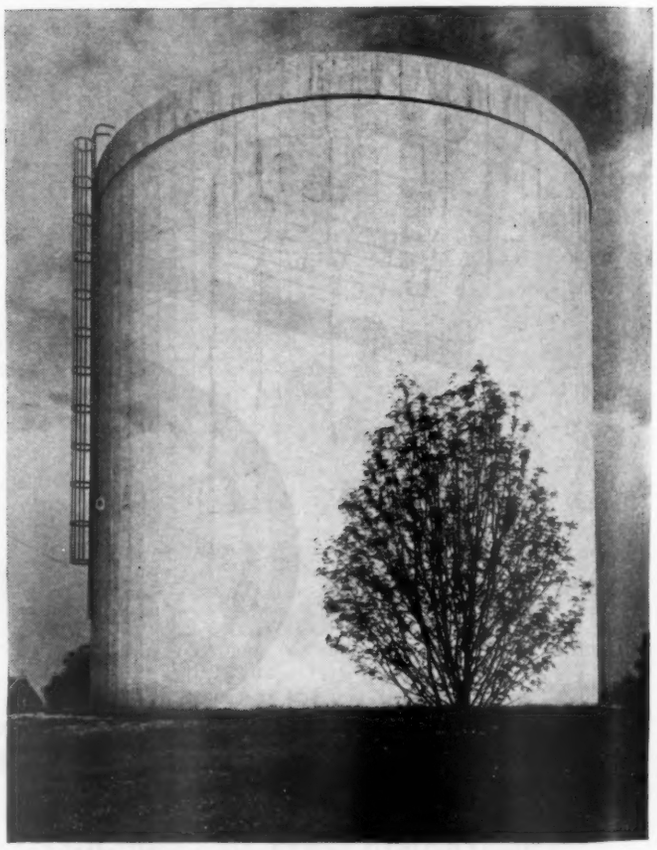
- Fortifies concrete against freeze and thaw;
- Resists pavement scaling;
- Reduces breakage, improves appearance, lowers water absorption, and generally increases strength of concrete block;
- Used with gratifying success for foundations, sidewalks, floors, paving, tanks, retaining walls, and concrete products.



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Makes Concrete More Durable and More Plastic

SUNDAY EVENINGS—American Broadcasting Company (Blue) Network—U. S. Steel's "Theatre Guild on the Air"

The CONCRETE MANUFACTURER

JANUARY, 1946

Vol. 9 No. 7

A MAGAZINE DEVOTED TO PRODUCTION OF CONCRETE PRODUCTS AND READY - MIXED CONCRETE

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Price Bros. Sell Flexicore Rights to Corbetti Interests

A new company known as the Flexicore Company, Inc., of New York, identified with the Corbetti Construction Company, has been formed as the result of the change of ownership of patent rights to Flexicore reinforced concrete floor and roofing slabs. The former owners were the Price Brothers of Dayton, Ohio. The Corbetti interests constitute a firm which contracts for large construction projects in the metropolitan New York area.

Flexicore units are to be made at a new plant in New York City, and the rights to manufacture them will be licensed to many other concerns throughout the United States and in foreign countries.

Elliott System Leases Plant at Birmingham

The Elliott System, which manufactures concrete blocks and prefabricated concrete houses, recently leased 54,000 square feet of space of the 1,500,000-foot floor space formerly occupied by the Bechtel-McCone modification plant at Birmingham, Alabama. The announcement was made by Lewis Jeffers, property manager for the Reconstruction Finance Corporation and J. F. Rushton, Jr., Chamber of Commerce president.

Oregon Block Firm Triples Capacity

At the new plant of the Empire Building Materials Company of Portland, Oregon, which recently went into operation, officials stated that the present capacity of 2,000 blocks per day soon would be increased to 6,000.

North Girard Plant Makes Extensive Improvements

At the North Girard Concrete Works, North Girard, Pennsylvania, extensive improvements are being made and new equipment added. In addition to rebuilding the plant, the company is installing a No. 7 Stearns Joltcrete, a mixer skip and a power lift truck. To insure an independent fuel supply for its curing system, the owners are drilling for natural gas, which will heat the boiler.

Products Plant Executive Passes at Age 80

Burritt A. Cushman, former president of the Bedford Hills Concrete Products Company of Bedford Hills, New York, died in Yonkers, New York, on December 3 at the age of 80 years. Mr. Cushman, who had become associated with the firm in 1931, was its president until he retired shortly before his death.

The San Pierre Cement Block Works of San Pierre, Indiana, which had been temporarily closed for remodeling and equipment repairs, was reopened recently to resume business. Roscoe Cummins is now in charge of operations as plant manager.

Coming Events

January 23-25, 1946—Cincinnati. Annual convention. National Ready Mixed Concrete Association, Netherland Plaza Hotel.

January 27-31, 1946 — Chicago. Annual Meeting, Associated Equipment Distributors Edgewater Beach Hotel.

January 29-February 1, 1946 — Oklahoma City. Annual meeting, American Association of State Highway Officials.

February 18-21, 1946—New York. Annual convention, American Concrete Institute, Statler Hotel.

February 25-March 1, 1946—Pittsburgh. Spring meeting, American Society of Testing Materials.

March 12-14, 1946—Chicago. Annual conference, National Concrete Masonry Association, Sherman Hotel.

April 11-13, 1946—Chicago. Annual convention, American Concrete Pipe Association, Edgewater Beach Hotel.

June 24-28, 1946—Buffalo. Annual meeting, American Society for Testing Materials, and exhibit of testing appartus and related equipment.

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P.C.A. Shows Block Producers How to Make Moisture Content Determinations

By WILLIAM M. AVERY

DURING the war emergency users of concrete masonry units were not only quite willing to disregard the A.S.T.M. and Federal specification requirements limiting moisture content, but in many cases virtually confiscated green block from producers' yards in order to meet construction schedules. Although the block manufacturers frequently protested, there was general recognition that the end thoroughly justified the means — that vital war production was far more important in the critical emergency than compliance with any specification requirement.

From all indications the results of this unfortunate but necessary practice will require some living down by the industry. Emergencies are quickly forgotten, but cracked concrete masonry walls are too likely to stand for many years, mutely pouring damnation upon the heads of products manufacturers, many of whom clearly foresaw the inevitable results but were helpless to forestall them.

Recognizing the importance of hastening the widest possible adherence to the specification now that the war emergency has passed, the Portland Cement Association has been presenting lectures and demonstrations in a number of cities throughout the country to show products manufacturers how they may comply with the moisture content limitation and how they may make simple determination tests in their own plants. The lectures and demonstrations have been presented over a period of weeks by C. F. Moore, of the association's general office, to large groups of products manufacturers gathered together in cities throughout the Middle West and East, including Milwaukee, Minneapolis, Omaha, Kansas City, Des Moines, Springfield, Illinois, Boston, Syracuse, New York City and Philadelphia. Eventually it is planned to cover the entire country.

The lecture retraces some of the history of the shrinkage problem. In the early days of the industry shrinkage cracking was a relatively minor problem because most construction with concrete masonry units was below grade. In the twenties when concrete masonry began appearing in exposed walls and larger buildings, the problem of cracked walls assumed serious proportions.

DATA SHEET AND DRYING RECORD

All Weights are in Pounds and Hundredths of Pounds

Block Mark	Size	Type of Agg.	Date of Mfgr.	Curing: Steam (Cat Temp.)	Curing: Forced Drying (Cat Temp.)	Curing: Air Drying Prot. or Exp.	Weights: In Air "A"	Weights: Suspended "S"	Weights: Saturated "W"	Drying Record: Placed in Oven — Time	Placed in Oven — Day	Placed in Oven — Date	Dry Weight and Loss by Periods: Time of Weighing	Weight "D"	Loss: Period	Loss: Total	Hours: Period	Hours: Total

Fig. 1

Tabulations and Results for Moisture Content & Absorption Tests

All Weights are in Pounds and Hundredths of Pounds

Description: Block Mark	Size	Aggregate	Date of Mfgr.	Curing: Steam (Temp.)	Curing: Forced Drng. (Temp.)	Curing: Air Drying Prot. or Exp.	Weights from Data Sheet: Sample in Air "A"	Suspended "S"	Saturated "W"	Dry "D"	Moisture Content: (A-D)÷(W-D)×100	Moisture Content: M.C. in % of Total Absn.	Absorption in lb. per c.f.: 62.4×(W-S)÷D	Absn. in lb. per cu. ft.	Absorption in % of Dry Wgt.: 100×(W-D)÷D	Absn. in % of "D"

Fig. 2

The association, suspecting that the trouble was caused by the shrinkage which occurs as concrete masonry units dry out, built a series of test panels to study the condition. The tests definitely established that sufficient shrinkage occurs to cause cracking. In 1934 the A.S.T.M. specifications were revised to include a clause limiting the moisture content of concrete masonry units at the time of delivery to 40 per cent. of the maximum absorption. It was widely felt then, and is today still the opinion of most authorities, that practically all serious shrinkage cracking can be eliminated by compliance with the 40 per cent. requirement. Unfortunately, however, the specification has never been rigidly enforced, and as a result compliance has been for the most part on a purely voluntary basis.

During the moribund thirties most products manufacturers had no difficulty accumulating large stock piles with the result that some drying out took place before masonry units were sold. This condition kept the shrinkage problem at bay until the war period, when stock piles quickly disappeared and adequate curing became almost impossible in the mad scramble for production.

The serious character of the problem that confronts the industry today is evidenced by the rewriting — now in progress — of the New York state specification to require moisture content determinations by independent laboratories in order to obtain rigid enforcement of the 40 per cent. limitation. The Federal Housing Administration has asked the Bureau of Standards to undertake studies of cracking in concrete masonry walls with a view to revising F.H.A. specifications. It is a fair assumption that before long moisture content tests will be required on all large jobs and on the smaller F.H.A. housing units.

Obviously, then, the day is not far distant when block manufacturers will have to *know* that their masonry units will meet the moisture content requirement before they are shipped. Several solutions are possible, depending to some extent upon the location of the plant, the season of the year and other factors. The maintenance of adequate stock piles, with proper protection and careful

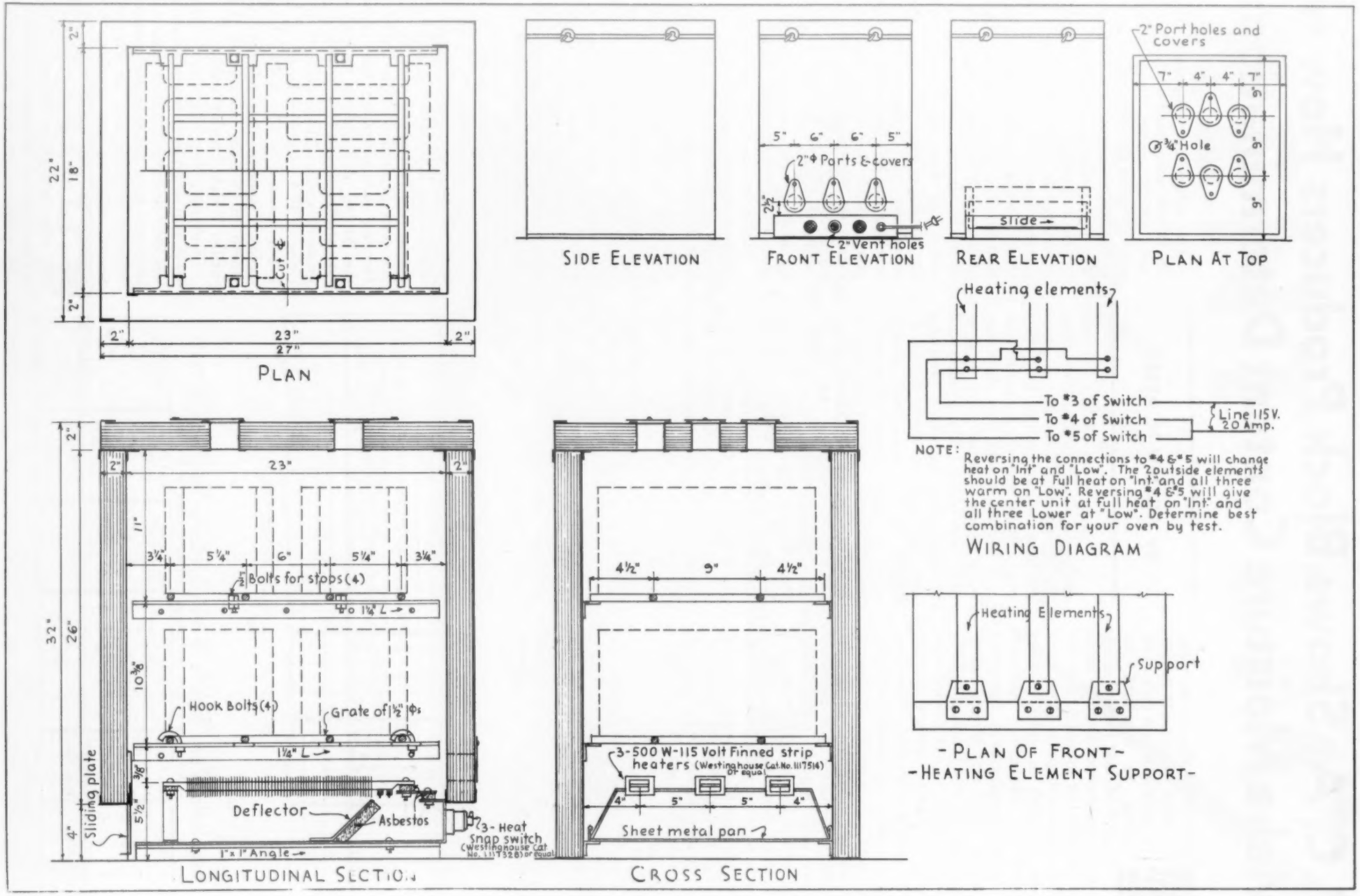

PLAN
SIDE ELEVATION
FRONT ELEVATION
REAR ELEVATION
PLAN AT TOP
2" Port holes and covers
2" ϕ Ports & covers
2" Vent holes
Slide
ϕ 3/4" Hole
Heating elements
To #3 of Switch
To #4 of Switch
To #5 of Switch
Line 115 V. 20 Amp.
NOTE: Reversing the connections to #4 & #5 will change heat on "Int" and "Low". The 2 outside elements should be at Full heat on "Int." and all three warm on "Low". Reversing #4 & #5 will give the center unit at full heat on "Int." and all three Lower at "Low". Determine best combination for your oven by test.
WIRING DIAGRAM
Heating Elements
Support
- PLAN OF FRONT -
- HEATING ELEMENT SUPPORT -
LONGITUDINAL SECTION
Bolts for stops (4)
Hook Bolts (4)
Grate of 1/2" ϕ rods
Sliding plate
Deflector
Asbestos
1" x 1" Angle
3- Heat Snap switch (Westinghouse Cat No. 11-T528) or Equal
CROSS SECTION
3-500 W-115 Volt Finned strip heaters (Westinghouse Cat. No. 111T514) or equal
Sheet metal pan

Fig. 3. This practical, electric drying oven was designed by the P. C. A., can be built at low cost by a tinsmith.

piling to permit free circulation of air, will in some cases be all that is necessary. When this is not possible, artificial drying of some kind will usually be required. Special rooms for drying may be used or hot air can be blown through stock piles, or steam may be exhausted from curing rooms and the units dried with a stream of dry, hot air. High-pressure-steam curing offers an excellent solution to the problem, since with this method adequate strength and low moisture content can be obtained in a cycle of only 24 hours.

Regardless of the particular method used, it should be borne in mind that units must be brought up to strength requirements *before* being dried to the proper moisture content. Little, if any, gain in strength can be effected after drying. Another important consideration in the over-all problem is the matter of educating contractors to protect units on the job until they are in the wall and covered. Protecting piles on the windward side and laying the top course in a pile with the cores horizontal will prevent the soaking of units on the job. During rains the cores in partially-built walls should be covered.

Since enforcement of the 40 per cent. requirement seems definitely in the offing, block manufacturers will soon be faced with the necessity of checking the moisture content of their output. The method of testing recommended by the P.C.A. is based on the A.S.T.M. standard testing procedure, and makes possible the keeping of a progressive record on moisture content with an average of only 10 to 15 minutes per day of one man's time. The necessary equipment should cost less than $175.

In the determination procedure described below, all weights are in pounds and hundredths of pounds.

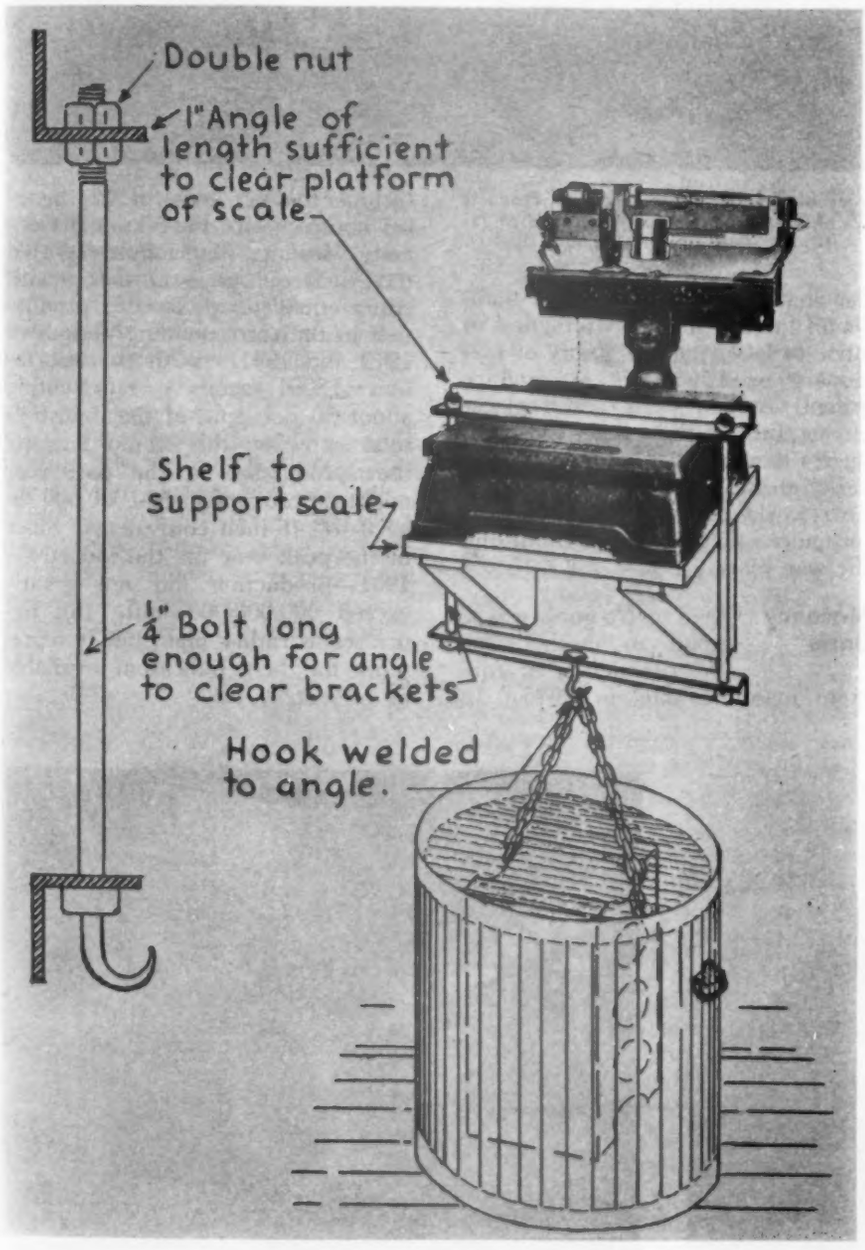

Double nut
1"Angle of length sufficient to clear platform of scale
Shelf to support scale
1" 4 Bolt long enough for angle to clear brackets
Hook welded to angle.

Fig. 4. Method of obtaining suspended weights with a platform scale.

Information for Data Sheet

1. Weigh the sample and record in column "A", Fig. 1.
2. Submerge sample completely in water for 24 hours.
3. Weigh sample suspended in water and record in column "S", Fig. 1. (Note: Fig. 4 illustrates a method of obtaining suspended weights with a platform scale.)
4. Allow to drain one minute on 3/8-inch or coarser mesh, wipe with damp cloth and weigh. Record in column "W", Fig. 1.
5. Dry in oven at 212 to 239 degrees F. (Note: Fig. 3, page 166, shows details of a simple, inexpensive drying oven designed by the P.C.A.) Drying record is kept and sample is weighed at 24-hour intervals until loss in weight does not exceed 1 per cent. in a 24-hour period. See Table 1, page 173, for permissible losses for shorter periods.

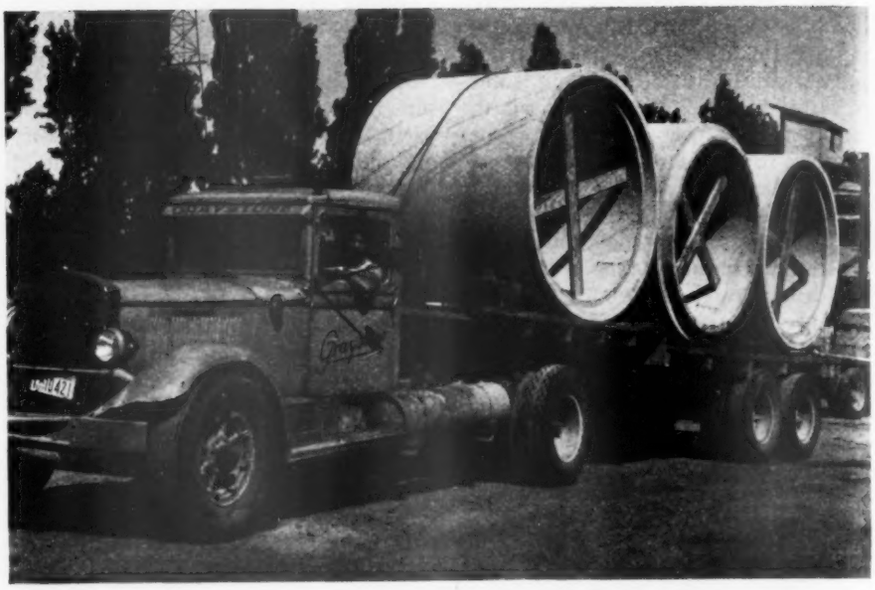
Tabulations and Results

6. Enter data recorded in Fig. 1 in proper columns of Fig. 2. Subtract weight in column "D" from that in column "A" and multiply by 100. Record in column "a", Fig. 2.
7. Subtract weight in column "D" from that in column "S" and record in column "b".
8. Divide number in column "a" by number in column "b", carrying the answer to the closest 1/10, and record in the column headed "Moisture Content". This is the moisture content expressed in percentage of the total absorption. (Specification 40 per cent. maximum.)
9. Multiply number in column "b" by 62.4 and record the nearest whole number in column "c".
10. Subtract weight in column "S" from weight in column "W" and record in column "d".
11. Divide number in column "c" by number in column "d", carrying the answer to one decimal place, and record in the column headed "Absorption in pounds per cubic foot."
12. Multiply the number in column "b" by 100 and record the nearest whole number in in column "e".

(*Continued on page* 173)

Concrete Masonry, Pipe Industries Maintain High Production in 1945

New Plants, Repairs and Extensions in Spotlight on Eve of Construction Boom; Labor Still Scarce



Truck of the Graystone Concrete Products Co. of Seattle carrying a 17-ton load of 72-inch culvert pipe.

IN the drama-packed year just passed, the concrete products industry continued to operate at a high level of production despite the ills shared in common with other industries—acute shortages of labor, machinery and parts, and continued drastic curtailment of building construction. More fortunate than many industries in that the end of the war posed no serious reconversion problems, products makers nonetheless faced the post-war period with plants that showed plainly the ravages of long-sustained high production with minimum maintenance and replacement of facilities.

Plants were being designed, revamped, overhauled and extended on an unprecedented scale in preparation for the tremendous home-building program that seemed to stretch indefinitely into the future. How well the industry could meet the challenge depended on a number of factors—on the willingness of labor to labor, on the ability of machinery manufacturers to produce urgently-needed parts and replacements, and on the capacity of producers themselves to withstand prosperity and to maintain in the peacetime world the fine record of performance they established during the war years.

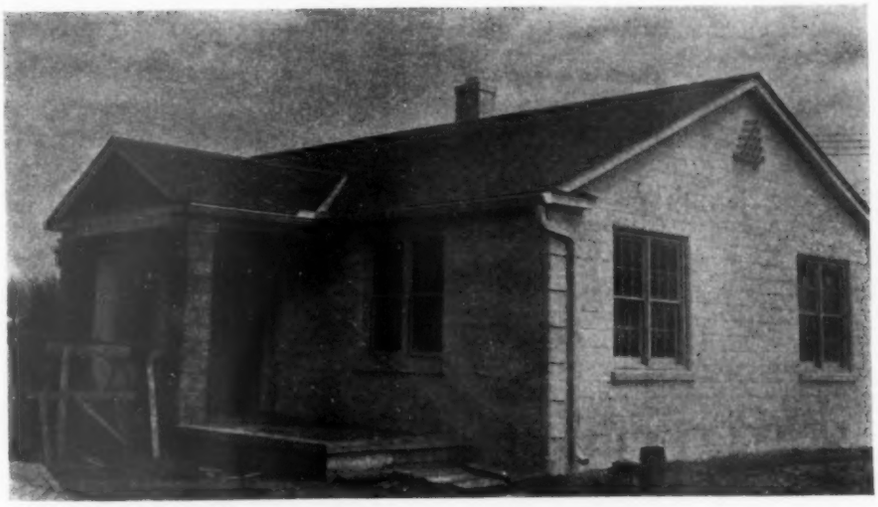
Exterior and interior views of an overseas Post Office on the site of the Madison Square Garden Bowl in Long Island City, for which the National Brick Co., Terra Cotta, D.C., furnished 392,000 concrete blocks. Over 15,000 barrels of cement was used in its construction.

Masonry Units One man's guess was as good as another's on the production of concrete masonry units in 1945. In October 61 per cent. of the member companies of the National Concrete Masonry Association reported that their output as of that month either equalled or exceeded production in the corresponding periods of 1940 and 1941. With the association's 300 members representing about 50 per cent. of the industry's total capacity, this would indicate that production in the past year might approximate 500,000,000 8- by 8- by 16-inch equivalents. Since in the peak year for the industry—1941—production did not greatly exceed 500,000,000 units, this figure seems rather high, but it represents the best indication available at present.

Plant Mechanization There was an abundance of evidence noted during the year to indicate that block makers are eliminating hand labor in their plants wherever it is possible to do so. Modern batching plants and machinery for the handling of bulk materials were being installed as rapidly as manufacturers could fill orders for the equipment. Gasoline- and electric-powered lift trucks were being used throughout the industry on a larger scale than ever before, and a number of plants were adopting high-lift fork-type trucks to speed-up yard handling and loading of block. A straw in the wind was the quick acceptance by the industry of the Stearns-Warren Yardhoist. How far this mechanization process might go no one could say, but it was clear by the closing months of 1945 that block makers were ready to go as far as their own ingenuity and the equipment manufacturers could blaze a trail.

Labor Except in a very few sections of the country the labor supply showed no marked improvement after V-J day, and single-shift operations still prevailed widely despite the heavy backlog of orders. Experience with double-shift operations during the war had persuaded many manufacturers that a second shift in a block plant is economically unsound, and that in the long run it is far better to increase production by increasing facilities. There were indications, too, of a healthier attitude on the part of management toward labor, as evidenced by the inclusion in new plant layouts of shower and wash rooms, lockers and adequate toilet facilities.

More plants are adopting high-lift fork trucks to speed up loading.



Office building of the Albany Concrete Products Company of Albany, Georgia, before completion. The interior incorporates a variety of treatments to demonstrate what can be accomplished with concrete masonry.

Price Ceilings Low price ceilings on block continued to be a major stumbling block in a number of localities throughout 1945. In the Miami area, where the situation has been particularly acute throughout the price-control era, Maule Industries, which manufactures about 70 per cent. of the block produced in the locality, threatened late in November to shut down its plant unless relief was granted.

In a few cases some price relief was granted during the year. Producers in the Los Angeles area were granted both an increase in ceiling prices and an allowance for delivery. Units with nominal dimensions of 4- by 8- by 12-inches were formerly sold and delivered for $55 per thousand. Under the new ceiling such units carried a price of $59 per thousand at the plant plus $6.50 for delivery within 12 miles, or $12 for delivery within 12 to 20 miles.

Although there were to date relatively few cases in which production in critical housing areas had been seriously impeded by the price situation, as 1946 dawned price ceilings remained one of the bottlenecks to be broken if the concrete-masonry industry was to fulfill its potential.

New Specifications One important change was made during the year in A.S.T.M. specifications for hollow load-bearing masonry units (C90-44). The new specifications read as follows:

> "Where concrete masonry units are used in exterior walls below grade, and for unprotected exterior walls above grade, the minimum compressive strength requirement is 1,000 pounds per square inch; these units are designated as Grade A. Where concrete masonry units are used above grade and protected from the weather with two coats of portland-cement paint or other satisfactory waterproofing, the minimum compressive strength requirement is 700 pounds per square inch; these units are designated as Grade B."

Another important development in regard to specifications was the rewriting of the New York state specification to require moisture content determinations by independent laboratories to enforce compliance with the 40 per cent. limitation. If this marked the beginning of a trend, it could have far-reaching effects on the industry, for compliance with the moisture content limitation has not been general, and relatively few producers could meet the specification without accumulating stock piles—a poor and unwel-

The industry produced thousands of practice bombs during the war.

come solution in a period of high demand. The ideal solution to the curing problem had still to be found, and block producers meanwhile displayed an understandable wait-and-see attitude while the proponents of various theories argued the merits of their systems.

Farm Market The farm market for concrete masonry units continued to make news in 1945, and an increasing number of producers were channeling their promotional efforts toward this promising outlet. The unique suitability of concrete masonry as a permanent, fireproof, rot- and vermin-proof, sanitary and low-cost material for the construction of farm buildings had won an impressive host of friends among farmers during the war years, and smart producers were determined not only to retain the market but to enlarge it wherever possible.

Growth of Associations A significant and encouraging trend for the future of the block industry was the steady growth of the National Concrete Masonry Association. Organized in 1943 with 160 members, by the end of 1945 the association represented about 300 companies and not less than 50 per cent. of the industry's total capacity. At a plant-design conference called in September by E. D. Dienhart, executive secretary of the association, 130 members braved the rigors of war-time traveling to attend. Further discussions of this timely subject were planned for the annual meeting in Chicago on March 12, 13 and 14.

Another indication of the industry's growing solidarity noted during the year was the formation in June of the Concrete Masonry Manufacturers' Association of Southern California. One of the first important projects of this new organization will be to conduct an educational program among contractors, engineers, architects and lending institutions stressing the advantages of concrete masonry construction over other types. According to officers of the new association the productive capacity of the industry has increased fifteen-fold in the Los Angeles area in the last three years, and producers are recognizing that a broadened market is an economic necessity if they are to continue to prosper during the post-war years.

As the concrete masonry industry moved into 1946 none of its problems—many though there were—seemed insurmountable, and the outlook for several years at least was for capacity business. With the new markets, the new friends and the sound reputation won under trying war time conditions, the industry seemed well able to cope with whatever the future might hold in store.

Concrete Pipe

According to the best available sources of information the production of concrete pipe in 1945 approximated 1,300,000 tons, down somewhat from the 1944 figure of 1,500,000 tons. The concrete pipe industry's chief problem in most sections of the country was not a deficiency of orders—most producers had more business booked than they could possibly take care of—but a severe shortage of manpower. This condition dated from early in the war period when large numbers of employees were lured into better-paying industries, and was perpetuated by the imposition of wage and price ceilings. Except in the southeast, where cheap labor was still fairly plentiful, few plants in the country at the close of 1945 were adequately manned, and there seemed little hope for material improvement in the situation until price ceilings were removed altogether or raised sufficiently to enable the industry to compete for labor.

Plant Improvements There was nevertheless evidence of a widespread refurbishing of productive facilities in anticipation of boom demand for concrete pipe in reclamation projects, river and harbor improvements, sewer construction and similar projects throughout the nation. Plants were being rebuilt, machinery overhauled and modern batching systems installed all over the country in preparation for what many experienced observers predicted would be the largest demand in the history of the industry.

Pipe Association In April, 1945, the long-planned reorganization of the American Concrete Pipe Association was brought to fruition with the appointment of Howard F. Peckworth as managing director. Mr. Peckworth had been for some years assistant to the secretary of the American Society of Civil Engineers and is widely acquainted throughout the construction industry. The association plans in the future to carry on widespread promotional activities, and will launch an extensive national advertising program in 1946. M. W. Loving, formerly secretary of the association, has been retained as consulting engineer.

With its present book capacity somewhere between 3,000,000 and 4,000,000 tons, the concrete pipe industry went into 1946 with supreme confidence in its ability to handle the vast markets that beckoned in the future. More extensive future use of concrete sewer pipe seemed assured, for in the larger diameters the industry has no competition. The excellent performance of concrete pipe in hundreds of airports built throughout the country during the war had established the product's reputation more firmly than ever, and there were lush markets beckoning in the farm field, in flood control and reclamation projects.

Florida Building Boom Creates Black Market

The current building boom in a number of Florida resort towns has attracted nationwide attention, since construction materials still are difficult to obtain elsewhere. Three reasons were given for the phenomenon: the utilization of locally produced sand and gravel in concrete blocks; an influx of labor from the North; ease of winter construction due to the mild climate. Black market prices are said to be prevailing in several sections, where residents have been known to pay twice and three times the market price for materials.

Pittsburgh Block Firm Builds Modern Plant

A remodeling and modernization program launched by the Rennekamp Supply Company of Pittsburgh has resulted in the rebuilding of its block plant. In addition, two new 250-ton Butler bins, a Besser Super Vibrapac block machine and a Clark power lift truck were installed.

The Concrete Industries Yearbook, with much helpful information on the ready-mixed concrete and concrete products industries, is distributed free to producers of record. To all others the price is $1.00. Any producer not now receiving this publication of the Concrete Manufacturer can obtain copies by sending us his name, address, and list of products.

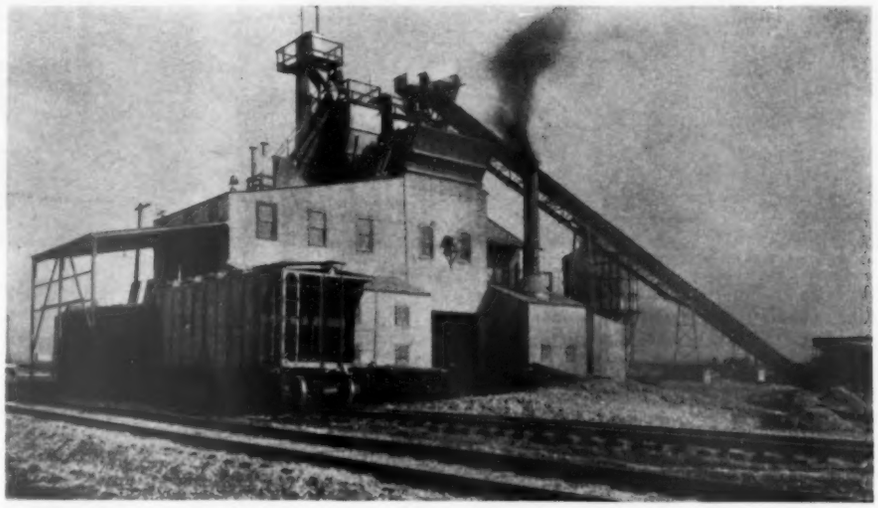
Tennessee Plant Furnishes Concrete For Atom Bomb Project

By JOSEPH H. DIXEY
President, Joseph Dixey Co.,
New York, N. Y.

another P-Q exclusive

THE difficulties encountered in supplying ready-mixed concrete for the Clinton Engineer Works at Oak Ridge, near Knoxville, Tenn., included everything previously experienced on other vital war projects plus handicaps normally unexpected in routine operation. The contract for supplying ready-mixed concrete for the construction of this Atomic Bomb project was the seventh for a large war project handled by the Transit Mix Concrete Corp. of New York City. The other six were the Elwood Ordnance Works, Kankakee Ordnance Works, Volunteer Ordnance Works, Letterkenny Ordnance Works, Sunflower Ordnance Works, and the Republic Steel Mill at South Chicago. Each of these contracts was negotiated by the writer, and all except the Sunflower Ordnance Works were under his direct supervision.

The Clinton Engineer Works contract was direct with the government and required the delivery of concrete to other prime contractors "when and as required." It was the largest, in volume of concrete produced, of any of the contracts—a total of 500,000 cu. yd. was delivered—and imposed a rigid schedule of peak production to be maintained. A stipulated maximum of 2,500 cu. yd. per day was required. The number of shifts to be worked per day was not stipulated in the contract. However, ready-mixed concrete was required throughout the job one shift per day. The time worked varied from 9 to 12 hours per day. While the contract contained no penalty clause, uninterrupted deliveries were of vital importance.



This plant was virtually duplicated in the Clinton Engineer Works layout at Oak Ridge. Bulk cement was unloaded from hopper cars and elevated to overhead auxiliary hopper by bucket lift.

When ordered to start erection of a plant all definite locations of construction had not been established. Considerable speculation entered into the selection of a site that would provide maximum trucking efficiency. The location selected for Plant No. 1 proved to be entirely satisfactory and the average haul from this plant throughout the job was two miles. No problem of plant location was presented when it became necessary to erect a second plant several months later to meet the construction requirements of the J. A. Jones Construction Co. These plants were 14 miles apart.

The plants were identical in design, capacity and operation. Plant No. 1 had been used previously for supplying the concrete for the Letterkenny Ordnance Works at Chambersburg, Pa. and Plant No. 2 had been similarly used for supplying the concrete for the construction of the Volunteer Ordnance Works at Chattanooga, Tenn. Before erection all worn and damaged parts were either repaired or replaced, as their condition required. During the twenty months operation, no time was lost as the result of any breakdown.

Complete replacements for motors, shafts, bearings, chains, sprock-

Feeder-belt in tunnel below stockpiles receives aggregates from hand-operated 18-by 18-inch gates set in a manner similar to the arrangement shown below, a scene in another plant.

A bucket elevator at a similar plant raises the material to the overhead hopper. Cement storage bin above conveyor has rotary valves and air jets for discharging cement.

This two-compartment overhead hopper which handles two types of cement was also duplicated at the Clinton plant.

Weight-measuring was speeded up at the Clinton plant by installing a live tare beam in the beam box to supplement four such as are shown above, a view in the batch room of another plant.

ets, buckets, pumps, etc., were stocked on the job at all times. Practically all parts subject to severe wear were duplicated in the job storeroom. Daily inspection was rigidly maintained, and maintenance was carried on at night and on Sundays.

Plant No. 1 After the location of Plant No. 1 had been determined the speed of construction and erection was of vital importance. Excavation and foundations were started on December 27, 1942, and Plant No. 1 was put in operation in February, 1943. Considerable rain, combined with an inadequate aggregate supply delayed completion.

The No. 1 Plant consisted of a 150-cu. yd., 3-compartment aggregate bin, a 1,200-bbl., 2-compartment ground-storage cement bin, a 200-bbl. 2-compartment auxiliary overhead cement bin, a 12-in. track-unloading screw conveyor, and a 350-bbl.-per-hr. cement bucket elevator. The weigh batcher was of 5½ cu. yd. capacity, equipped with 4 aggregate and cement scale beams and one tare beam. The gates were manually operated. Water was measured automatically by weight.

Two steam boilers of 125- and 75-lb. capacity heated mixing water and the plant offices during cold weather. Hot water storage tanks of 3,600-gal. capacity proved adequate.

All cement for this plant was delivered in bulk in hopper bottom cars, to a siding adjacent to the plant. It was not uncommon to unload 8 cars per day. A considerable volume of cement used was extraordinarily hot, consequently it was necessary to use low-pressure air and electric vibrators simultaneously on the auxiliary cement bin at the gates over the batcher when weighing cement.

As this project was in a section of the country subject to heavy rainfall it was found desirable to install electrically-operated sump pumps at the base of the cement elevator and in the loading tunnel. These pumps functioned satisfactorily and rains of cloudburst proportions did no damage and did not interfere with the operations at any time.

A special water line was installed from a reservoir constructed for the exclusive use of Plant No. 1. Water was furnished at a constant pressure of 60 lb. at the batch floor. This facilitated the operation of the automatic water weigh tank.

A 30-in. inclined belt conveyor having a capacity of 375 cu. yd. per hour supplied aggregates to the bin. This inclined belt was supplied by a 30-in. horizontal feeder belt that was operated in a reinforced concrete tunnel 60 feet long, over which material was stockpiled at times in quantities in excess of 35,000 tons. The loading of this feeder belt was controlled by six 18- by 18-in. clamshell gates spaced 8 feet on centers. They were manually operated and the lips of the gates were 14 inches above the belt. The flow of material was accurately controlled. A series of red, white and blue lights operated from the turnhead platform, over the aggregate bin, indicated the type of aggregate required. A bell signal was provided for attracting the attention of the man operating the loading gates. These stockpiles were maintained at all times with a 2-cu. yd. crane having a 75-ft. boom. This plant consistently averaged 225 cu. yd. of concrete per hour and had a peak production of 285 cu. yd. per hour on several occasions.

A 5-cu. yd. batch of sand, gravel and cement required an average of 52 seconds to weigh and discharge into the mixer truck.

The plant was fully enclosed with corrugated sheet metal and provided offices where all the billing, clerical work and other details pertaining to the operation were carried on. A fully-equipped shop was erected at the No. 1 plant, where all truck maintenance and overhauling was done. Complete stocks of parts, tires, etc., were maintained at all times.

Plant No. 2 As the project increased in scope it became necessary to erect a second batching plant at the material unloading dock, 14 miles from the No. 1 plant. The average haul from this setup was 1½ miles. This plant was an exact duplicate of the No. 1 plant, except that the loading belts were shorter and no feeder tunnel was provided. The hourly capacity of the plants was the same.

It is interesting to note that all the cement used at the No. 2 plant was trucked from the No. 1 plant. Three mixer trucks of 5-cu. yd. capacity each trucked over 150,000 bbl. of cement to this plant. The water lines and bells were removed from the mixers and hauling cement in this manner proved highly satisfactory in every way. The unloading was accomplished by partially opening the discharge gate and slowly revolving the body in the discharge direction. The cement was dumped into a truck-unloading hopper mounted on the 12-in. screw conveyor. These three mixer trucks frequently handled 1,200 bbl. of cement per day.

The average daily demand at Plant No. 1 was approximately twice that of Plant No. 2, and it batched 80 per cent. of the concrete furnished under the contract. The

maximum yardage produced at the No. 1 plant was 2,200 cu. yd. in a working day of 10 hours, and at the No. 2 plant, 1,500 cu. yd. was the maximum delivered for the same working period.

Sand and gravel was produced under a subcontract with the Birmingham Slag Co. An adequate source of sand and coarse aggregate had to be developed, as the construction of the T.V.A. dams had exhausted most of the known sand and gravel deposits from the Tennessee River within economic hauling distance of the project. These deposits had previously shown an excess of coarse aggregate; consequently it was feared that the quantity of sand would be inadequate. The tremendous quantity of each aggregate required for the construction necessitated a large processing plant. This material was dredged from the river, processed on the dredge, and towed approximately 20 miles to a dock on the Clinch River, at the west end of the reservation, where it was unloaded and stockpiled, to be reloaded into trucks.

As additional work was authorized, and the quantity of concrete required increased, it became apparent that the supply of sand and gravel would be inadequate for the completion of the project. Arrangements were made with the prime contractor, Stone & Webster Engineering Corp. to supply crushed stone, produced by their subcontractor for road work, to Plant No. 1. This stone was found to be suitable for concrete aggregate and was available in considerable quantity. It was trucked from the quarry to the No. 1 plant, a distance of 2 miles. Sand was then delivered on railroad cars from Montgomery, Ala., a distance of about 240 miles. This was the nearest plant that could produce sand in sufficient quantity. Concrete for the remainder of the job was mixed with aggregate supplied in this manner.

At the peak of construction there were fifty-eight 5-cu. yd. Rex and Jaeger mixer trucks, mounted on Mack FJ and FK trucks powered by Cummins HB diesel engines, operating under this contract. There was also a considerable number of government-owned mixer trucks which were loaded at these plants for miscellaneous work on the project. These ranged in size from 1½-cu. yd. to 3-cu. yd. capacity. The mixers were operated by both separate engine drive and power take-off. The government-owned vehicles were all gasoline-powered units.

The experience gained on projects of similar nature was invaluable in providing uninterrupted service. It had been previously determined that constant production of 200 cu. yd. per hour required heavier than accepted standard of some parts. It had become advisable to use considerably larger head shafts and bearings on the cement bucket elevators, heavier hanging rods on the aggregate weigh batchers and oversize drive chain, sprockets and shafting on the aggregate belt conveyors. These changes were justified by the continuity of service obtained throughout the job.

The organization responsible for the successful prosecution of the work consisted of personnel of long experience in the ready-mixed-concrete industry in New York City. In addition to the writer, who acted in the capacity of vice president and general manager, the personnel was as follows: Arthur J. Wright, general superintendent; Martin McCann and Edward Egan, plant superintendents; Charles Garrison and Charles Brucia, shop superintendents. Mrs. Harriett Felleman and Mrs. Thelma K. Bates handled all office details. The maintenance of both plants was under the direction of Harold Anderson.

We gratefully acknowledge the coöperation and assistance of the U.S.E.D., Manhattan District, Stone & Webster Engineering Corp., J. A. Jones Construction Co., and E. I. duPont de Nemours & Co., prime contractors, for whom we furnished concrete.

Moisture Content

(from page 167)

13. Record the weight "D" in column "f".
14. Divide number in column "e" by the number in column "f" carrying the answer to the closest 1/100, and record in the last column. This is the absorption expressed as a percentage of the total absorption.

It should be pointed out that the relatively small cost of maintaining moisture content records at the plant can yield excellent dividends in the marketing of concrete masonry units. Producers who can *show* architects, contractors and builders that their block meet the specifications will have an important and material advantage over those who can do no more than make claims. This will become increasingly apparent as enforcement of the 40 per cent. limitation becomes more general—in the avoidance of rejected shipments, in the building of good will, and in the satisfaction of knowing that a superior product is being manufactured. Promotional literature and newspaper advertisements could well stress the importance to the user of purchasing dried block that meet the specifications.

In the final analysis, the elimination of shrinkage cracking is not the problem of any one individual plant, but an industry-wide concern, and no true solution will be possible unless eventually all producers comply with the specifications. Although there are many factors other than shrinkage which cause masonry walls to crack, it is generally recognized that shrinkage is one of the most frequent causes, and failures are inevitably charged up to the product rather than to individual manufacturers. Since in this case the solution is definitely within reach of all producers, we join the P.C.A. in urging the industry to act now while there is still a sellers' market in preparation for tomorrow when there will just as certainly be a buyers' market.

Table of Losses Comparable to a 1% Loss in 24 Hours				Federal Specification 0.25% in 5 Hours	
Weight of Sample	1% Loss 24 Hours	Comparable Loss in 12 Hours	Comparable Loss in 6 Hours	Weight of Sample	Permissible Loss
10 lb.	0.10 lb.	0.05 lb.	0.02 lb.	10 lb.	.03
15 lb.	0.15 lb.	0.07 lb.	0.03 lb.	15 lb.	.04
20 lb.	0.20 lb.	0.10 lb.	0.05 lb.	20 lb.	.05
25 lb.	0.25 lb.	0.12 lb.	0.06 lb.	25 lb.	.06
30 lb.	0.30 lb.	0.15 lb.	0.07 lb.	30 lb.	.08
35 lb.	0.35 lb.	0.17 lb.	0.08 lb.	35 lb.	.09
40 lb.	0.40 lb.	0.20 lb.	0.10 lb.	40 lb.	.10
45 lb.	0.45 lb.	0.22 lb.	0.11 lb.	45 lb.	.11
50 lb.	0.50 lb.	0.25 lb.	0.12 lb.	50 lb.	.13

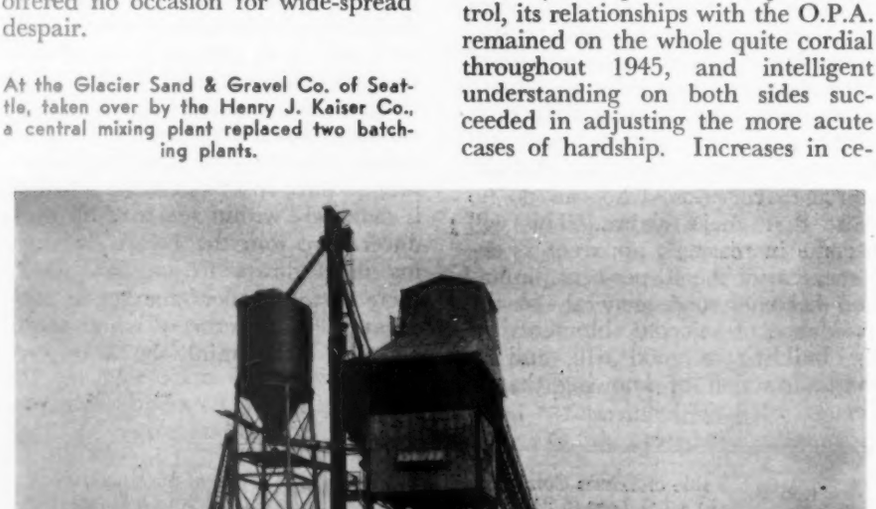
Table I. Losses comparable to a one per cent. loss in 24 hours.

Ready-Mixed Plants in Good Shape For Building Construction Boom

1945 Production of 10,000,000 Cubic Yards Shows Effect of Continued Curtailment of Building

WHILE there were no figures available on which to base any accurate estimate of the production of ready-mixed concrete in 1945, the low level of construction activity throughout the year suggested that output was probably down somewhat from the 1944 figure of 11,000,000 cubic yards. If production approximated 10,000,000 cubic yards—which was as good a guess as any—in the year just passed, it was a far cry indeed from 1942, when booming war construction consumed 24,000,000 cubic yards, but 1942 was hardly a fair basis for comparison. When annual production amounted to 10,000,000 cubic yards in 1940 the figure represented an all-time high for the industry. Viewed in this light the 1945 output offered no occasion for wide-spread despair.

At the Glacier Sand & Gravel Co. of Seattle, taken over by the Henry J. Kaiser Co., a central mixing plant replaced two batching plants.



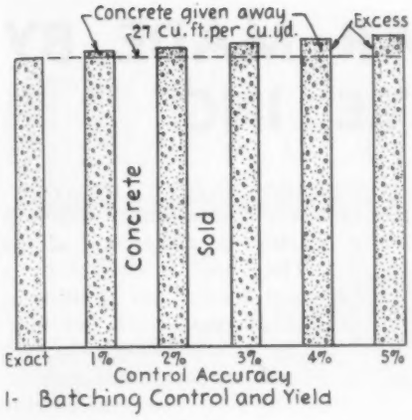
Condition of Plants As it faced the new year and the certainty of an upswing in construction activity, the ready-mixed-concrete industry was more fortunate than many in that it had virtually no reconversion problems, and its plants on the whole were in good condition to meet the anticipated upsurge in demand. After the big push for production had passed, most operators wisely made such repairs and replacements as were possible under the existing restrictions. The condition of trucks, however, was another story, and there existed at the end of 1945 a tremendous demand for both new equipment and replacement parts. How soon the equipment manufacturers could satisfy this pent-up demand was problematical in view of the turbulent labor situation, but it was a fair guess that producers would still be clamoring for new trucks well into 1947.

Price Control Although the industry hoped, in common with most other industries, for an early relinquishment of price control, its relationships with the O.P.A. remained on the whole quite cordial throughout 1945, and intelligent understanding on both sides succeeded in adjusting the more acute cases of hardship. Increases in cement prices approved by the O.P.A. during the year were in almost all cases passed on to the purchasers of ready-mixed concrete. In southern California, where the local O.P.A. contended that ready-mixed-concrete producers could absorb a 20-cent-a-barrel increase in cement prices, the producers, through the National Ready Mixed Concrete Association, successfully demonstrated that this was not the case, and relief was finally granted.

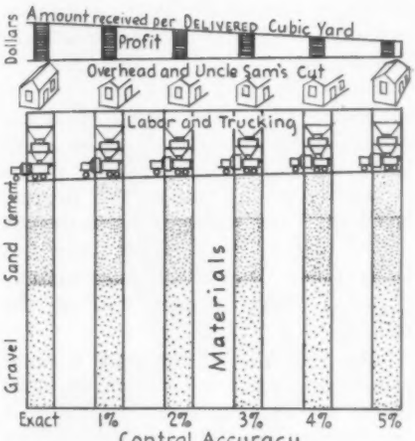
Labor Some improvement was noted during the latter part of the year in the labor situation, and with large numbers of former employees returning from military service most companies anticipated being able to handle an increased volume of business. The labor picture had been clouded somewhat by a ruling from Wage and Hour Administrator Walling which placed an altogether new interpretation on what constitutes interstate commerce and exposed thousands of employers, including ready-mixed-concrete producers, to the danger of suits for back pay. Efforts were being made to obtain clarification of the ruling and meanwhile producers who were not in compliance with the provisions of the Wage and Hour Act could keep their fingers crossed and hoped for the best.

Specifications On the specification horizon it was predicted that more than half the states would soon undertake revisions and that a great many new specifications covering ready-mixed-concrete would soon be forthcoming. The Pennsylvania Highway District specifications completed during 1945 establish limits of 2 to 4 r.p.m. for agitating and 8 to 12 r.p.m. for mixing, and also require that revolution counters be mounted on the trucks. It was also revealed that the next printed Illinois State Highway specifications—which will be the first covering ready-mixed concrete—will in all probability fix a 30-minute limit on time of haul.

Dump Trucks One of the livelier topics of discussion in the industry during the year centered around the delivery of air-



1- Batching Control and Yield



2- Batching Control and Profit

Graphs show effect of accurate production controls on yield and profit.

entrained concrete in dump trucks. A producer in Toledo, Ohio, reported making such deliveries up to a distance of 19 miles with little segregation and uniform strengths, although the method is unquestionably more suitable for relatively short hauls. Since even before the introduction of air-entraining cements there had been many situations in which concrete could be and was successfully delivered in dump trucks, the resurgence of the practice was probably not as revolutionary as the volume of heated discussion might indicate. Nevertheless there was general sentiment in the industry favoring an early review of the present A.S.T.M. specification which limits ready-mixed concrete to material delivered in agitator trucks, and in effect rules out central mixing with dump-truck delivery.

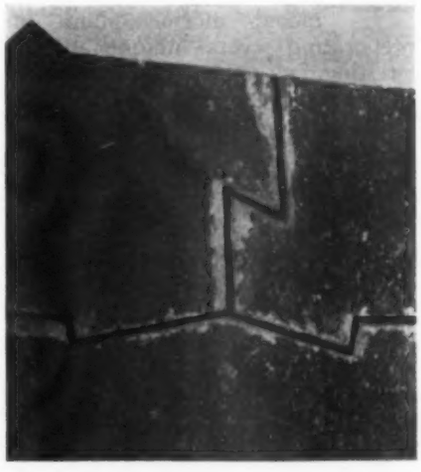
Although there were no outstanding technological developments during 1945, the industry as a whole was showing far more interest than ever before in accurate production controls and their effect upon quality, yield and profits. An increasing number of producers were employing admixtures of one kind or another to increase the durability and watertightness of their product and to reduce bleeding, spalling and other undesirable characteristics. With the nation on the verge of one of the biggest construction booms in its history, the ready-mixed concrete industry had every assurance of near-capacity business for several years, and operators were prepared to meet the challenge by producing a quality material specifically designed to perform well under the conditions imposed by its use.

View of Concretos Cientificos, Arbide, S.A., Mixcoac, Mexico City, showing three aggregate crushing, screening and washing plants and the concrete plant.

Sawed Coral Walls Found on Okinawa

Navy Construction Battalion personnel at work on the island of Okinawa found some unique types of construction in native buildings. To the right and below are illustrations of interlocking joints in the walls of sawed coral blocks commonly used by Okinawans. The irregular jigsaw joints are apparently considered effective for providing maximum stability. Labor cost is evidently not an important consideration.

Seabees converted the home in the background of the illustration shown below into an office for brigade headquarters.



PUTTY, READY-MIXED MORTAR MADE BY UNIQUE METHODS AT MACATEE, INC.

General view of the lime putty plant of Macatee, Inc., Dallas, Texas.

another ON THE SPOT report

MACATEE, INC., of Dallas, Texas, has for a number of years successfully operated a lime putty and ready-mixed mortar plant incorporating several unique and interesting features of their own development. The firm is an off-shoot of what was once W. L. Macatee & Sons, who established themselves at Houston, Texas, in 1860, and opened a branch office at Dallas in 1911. The present owners purchased the business in 1932, and not only continued to supply a complete line of general building materials—except lumber and mill work—but soon added a contracting department and began experimenting with the production of lime putty and ready-mixed mortar.

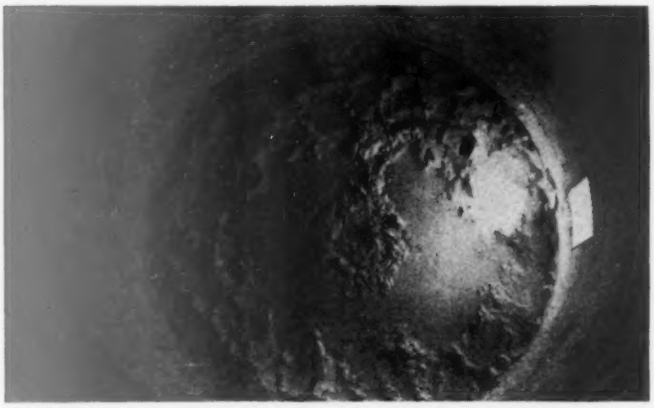
The plant, located in a semi-downtown section of Dallas, is remarkable for its simplicity and compactness. Lime is brought in by trucks which are unloaded by hand shovels and wheelbarrows into a 4-compartment hopper of 2,000 pounds capacity. The delivery trucks average about 11 tons to a load, and the usual practice is to operate the slaking plant for an entire day, unloading a truck by gradual stages as the various compartments of the hopper are emptied. The lump lime, graded from 1 inch down, is fed from the hopper to the slaker box by an inclined bucket elevator; about 22 cubic feet of lump lime goes into each batch.

The slaker box measuring 8 feet in length, 3 feet in width and 4½ feet in depth, is of welded steel construction, and the stirring action is accomplished with 8 paddles mounted on a steel shaft which is set in bearings at either end of the frame. The shaft is driven by a 5-horsepower motor and it turns at the rate of 24 revolutions per minute. Water is introduced through a 2-inch diameter pipe extending the full length of the box and having ½-inch diameter drilled holes at about 6-inch centers. An additional supply line at the rear of the slaker box is used to introduce a small flow of water during the part of the operation when heat is generated most rapidly.

From 20 to 30 minutes are required to slake each batch, and the operation is considered to be complete when the temperature of the material rises to about 190 degrees F. A dial thermometer shows the operator when this temperature has been reached, and he immediately opens a valve at one end of the slaker.

The lime milk flows onto a small vibrating screen fitted with 24-mesh cloth to remove any rock residue or foreign matter present. This screening operation is considered to be almost essential if the lime putty is to be used in whitecoat work, and it has the additional effect of protecting the pump against damage or excessively rapid wear.

By determining the slaking time in accordance with temperature rise, the company has found that several distinct advantages are secured. The slaking is accomplished with the least possible amount of water, and in consequence there is less water to enter the storage tanks. Burned patches are thought to be eliminated by the use of this method, and the batches are quite uniform both in



Looking into one of the lime storage tanks, which are 30 feet high and 12 feet in diameter.

Steel cone suspended in the tank to cause the outflow of lime to come from the outside wall and thus remain even.

QUALITY SPELLS Performance

SELECT cement for concrete that fits the job . . . use these three quality Lone Star Cements for utmost strength and durability:

LONE STAR CEMENT for outstanding performance on all types of concrete work . . .

'INCOR'* 24-HOUR CEMENT, where reduced curing time and dependable high early strength provide important advantages . . .

LONE STAR AIR-ENTRAINING PORTLAND CEMENT for specific requirements in highway and various other uses.

These Cements cover the entire construction field . . . dependable performance helps build good-will for the Ready-Mix and Products Plant Operator.

*Reg. U. S. Pat. Off.

Lone Star Cement Research Laboratories have developed performance data on various concreting problems. This information is available on request to Lone Star Cement Corporation, 342 Madison Ave., New York 17, N. Y.

LONE STAR CEMENT CORPORATION

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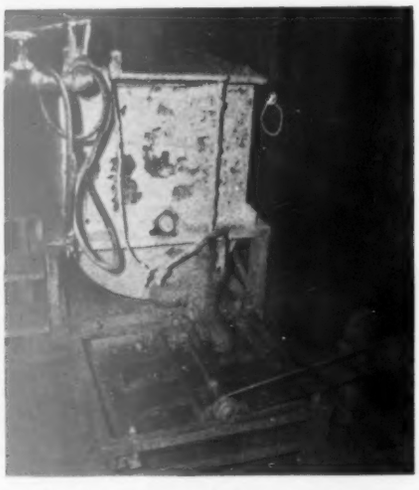
LONE STAR CEMENT, WITH ITS SUBSIDIARIES, IS ONE OF THE WORLD'S LARGEST CEMENT PRODUCERS: 15 MODERN MILLS, 25-MILLION BARRELS ANNUAL CAPACITY

regard to quality and density. Every effort is made to attain the maximum density of material which can be handled by the pump, and in fact the lime milk is almost heavy enough to be used as putty when it leaves the slaker.

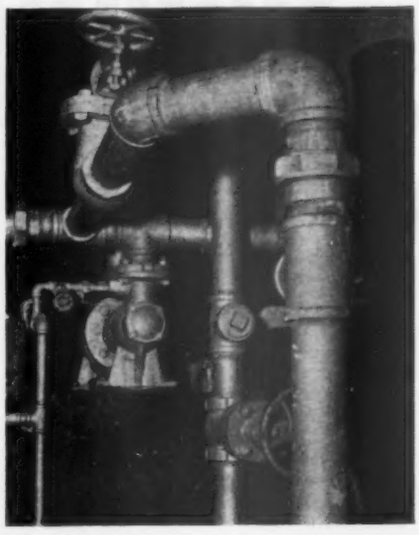
The slaked lime after passing through the vibrating screen drops into a concrete storage pit, from which it is pumped to the storage tanks. A number of seemingly insurmountable operating problems were eliminated at a single stroke when the proper pump was found for this exceedingly difficult service. The unit that was finally installed is a Robbins & Meyers B-6 Moylo pump specially designed with a chromium rotor and a rubber stator in order to withstand the severe cutting action of the grit present in the lime. The pump handles 58 gallons of lime putty per minute and is driven by a 5-horsepower reversible motor. It is mounted between the two storage tanks at a distance of about 75 feet from the lime pit, and is used not only for



The slaker box and the vibrating screen which removes rock residue.

drawing the hot lime into the tanks, but, by reversing the pump, lime putty can be drawn from the tanks and elevated to the ready-mixed mortar plant.

The steel tanks are 12 feet in diameter by 30 feet high, and the 6-inch diameter outlet and inlet pipes are located in the bottoms. A brick cove is installed in the angle at the bottom of each tank and a heavy steel cone is suspended in the center to make the outflow of lime come from the outside wall where otherwise the material would have a tendency to remain too long and become dry and hard. This device was worked out by the company only after considerable difficulty had been encountered, and it has done an astonishingly good job of keeping the lime flow even as the tanks are emptied. The baffle is actually a truncated cone with a maximum



This 2½-inch pump handles 58 gallons of lime putty per minute.

diameter of about 9 feet and a height of 4 feet.

So far as the slaking process is concerned, there is little difference between the procedure followed in making lime putty for whitecoat work and that used for mortar. For lime putty it is particularly desirable to have the least possible amount of moisture present. This material is pumped into wooden tanks and aged for at least 8 weeks before it is sold. About 15,000 cubic feet can be stored, and it has been found that the material may be allowed to age for as long as 8 weeks without incurring any serious loss. It is marketed in buckets and sold by the cubic foot for use in whitecoat plaster work in hospitals and residences. Plaster of paris is added on the job by the user.

The mortar mixing plant does not differ in any important respect from most conventional central mixing. Sand is loaded into a 12-cubic yard overhead bin by means of a bucket elevator, and the lime milk is pumped from the steel storage tank into a 20-cubic-foot lime hopper above the mixer. A 2-cubic-yard Concrete Transport mixer is used and the materials—lime putty and brick mortar sand—are measured by volume, generally in the proportions of 7 cubic feet of lime to 1 cubic yard of sand. The water addition is made in accordance with the operator's judgment and mixing time averages between 4 and 5 minutes.

Three-cubic-yard Ford dump trucks are used for making deliveries within a radius of 35 to 40 miles. The output of the plant has been averaging between 30 and 40 cubic yards per day, but actual capacity is considerably greater. During the first few years of operation the company used transit-mix trucks altogether, but it was finally determined that central mixing and dump-truck delivery was entirely adequate.

Another interesting fact the company has learned in its development of an efficient lime putty plant concerns the matter of painting storage tanks. Aluminum paint was applied to the tanks to prevent rust, and it was immediately noticed that the rate of heat dissipation dropped alarmingly; or, to state it another way, it took a great deal longer for the lime to cool in a painted tank than in one that had no protective coating. Heating engineers, of course, have recognized and applied the same principle for many years, but its application to the production of lime putty appears to have gone unnoticed until Macatee, Inc., discovered it the hard way.

More and more builders in the Dallas area have been convinced by

Dump trucks loading under the concrete transport mixer.

trying the service offered by Macatee, Inc., that aged lime putty is unexcelled for making mortar, and the company has every reason to anticipate a heavy demand for its product in the forthcoming building boom. George P. Macatee, Jr. is president of the firm, C. O. Johnson is vice-president and Horace Butler is secretary and treasurer.

What do you want to know about the ready-mixed concrete industry or about concrete blocks, pipes, etc.? The Concrete Industries Yearbook can probably tell you.

NEW MACHINERY and SUPPLIES

● New Truck Mixer

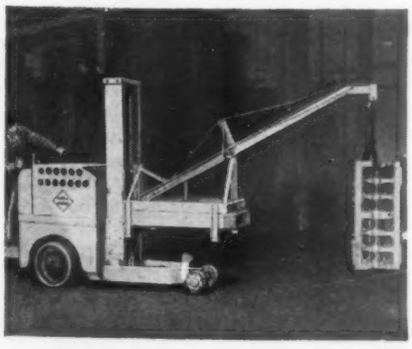
The latest type of truck mixer to be offered by the Jaeger Machine Company of Columbus, Ohio, is the "Speed Merchant," which is equipped with a sealed top-loading drum. This model is recommended for handling wet-mix concrete or used for other types of ready-mix plants. Top loading is said to facilitate taking a full batch of material in one drop and also to insure the proper distribution of the various materials. The manufacturer states that the drum, sealed by a quick-action discharge door, retains heat in the winter

Machine features a sealed top-loading drum.

and protects the concrete from bad weather at all times. It is also reported to maintain the pre-determined slump of material on long-haul deliveries by the use of the slow drum speed through two-speed transmission. End-loading units are also offered with a gated hopper which remains sealed to the drum, permitting the use of a light-pressure rubber seal with built-in pressure lubrication. The low-mounted water tank on the main frame, a high-pressure water pump, positive aligned transmission, and center drive to internal drum gear are features of both types.

● Boom Attachment

A simple, easily constructed boom attachment enables a machine tool builder to use a high-lift platform truck manufactured by the Elwell-Parker Electric Company of Cleveland for a wide range of "intermediary" transportation jobs.



Attachment can be applied or removed in a few minutes.

S-T-R-E-T-C-H-I-N-G A BOXCAR

IN THE EARLY STAGES OF THE WAR, a serious shortage of shipping space threatened supply lines to Europe and the Pacific. Aiding in the urgent search for a solution to the problem, The Cambridge Tile Manufacturing Company, Cincinnati, successfully completed an experiment in compressing three carloads of dried whole egg powder and loading them into a single boxcar.

Presses that had been used to compress clay into Suntile were quickly converted into food-compression equipment through the use of new dies designed and built in Cambridge Tile's own shops. Facilities were rapidly expanded to meet the ever increasing demand of the Armed Service Forces for compressed emergency rations. But the conversion created handling problems that throttled production and prevented full utilization of the extra shipping space made available by the new food compression method.

So Towmotor engineers were called in to install a modern materials handling system. 100-pound bags of dried food powders were loaded on pallets in the receiving room and fed to the production line in a continuous, controlled stream. The finished cakes of compressed food were packed into shipping cartons, assembled into large unit loads, and moved directly into the boxcars by one girl and a Towmotor. Work schedules were accurately timed to provide maximum output per man and machine. Closer inventory control eliminated delays and tie-ups. Production speed was increased to machine capacity, freed from the limitations imposed by slow handling methods. Most important, Towmotor made possible immediate and full utilization of every foot of shipping space.

The results achieved at Cambridge Tile are typical of Towmotor installations throughout industry. The know-how and experience that contributed numerous opportunities to increase productive output also enabled Cambridge Tile to effect savings of $1,000 a month in handling costs alone. The Towmotor Materials Handling Analysis Guide, a product of know-how and experience, will greatly simplify your handling problem; send for a copy today. Towmotor Corporation, 1228 East 152nd Street, Cleveland 10, Ohio.

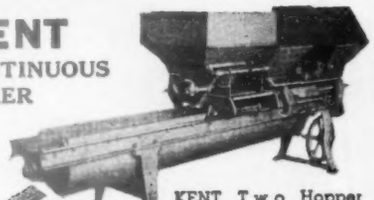
TAKE IT UP WITH

TOWMOTOR

THE ONE-MAN-GANG

"IT JUST KEEPS ROLLIN' ALONG"

KENT
CONTINUOUS
MIXER



KENT Two Hopper No. 2½ Mixer. Capacity, 3 cubic yards per hour.

A STEADY STREAM OF PERFECTLY PROCESSED CONCRETE — insured by this KENT machine—is just what your block plant needs to establish output and profit records.

KENT accuracy in measuring cement and aggregates — KENT thoroughness of mixing — KENT simplicity and durability — KENT operating economy—enable concrete block producers everywhere to handle current orders and "get set" for bigger post-war business.

For Clean Pallets . . .

dip 'em in the

KENT DUNKER

Your pallets will mold better blocks and give longer service if they are regularly cleaned and oiled in a KENT Dunker. Hang 'em on the pins—as you take them off, the rest are rotated through the tank. Truck crank case oil works perfectly.

Write for Bulletin

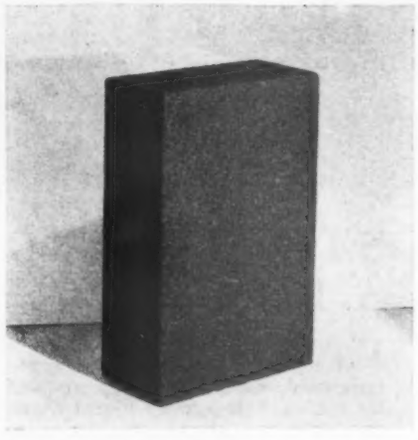
The KENT MACHINE CO.
Cuyahoga Falls, Ohio

Many castings and parts for machine tools are of a size or shape not readily handled on skids or in skid boxes, and they must be transported to other buildings or to stations not reached by overhead traveling cranes. The machine tool builder adapts his platform trucks to these loads by means of a detachable boom built from steel angles and rods as shown in the illustrations.

The platform of the truck is driven underneath the device and a latch bar on the attachment is engaged with a cross member of the truck's elevating mechanism, which holds it firmly while a load is being lifted and transported. The attachment can be applied or removed in a few minutes. The boom has a separate motor for elevating and lowering the load by means of a cable. The lead from this motor can be plugged into the truck's regular battery equipment.

● New Insulation Material

The Pittsburgh Corning Corporation of Pittsburgh, has on the market a new insulation material known as "PC Foamglas." This product is made by adding finely divided carbon to ground glass and subjecting the mixture to controlled high-temperature heat treatment. This causes the charge to expand into a mass of black foam which fills the mould to capacity and solidifies. The manufacturer states that the result is a rigid material of which one cubic foot contains more than ten million cells of inert gas hermetically sealed in pure glass. When the moulds are stripped, the blocks of Foamglas are annealed



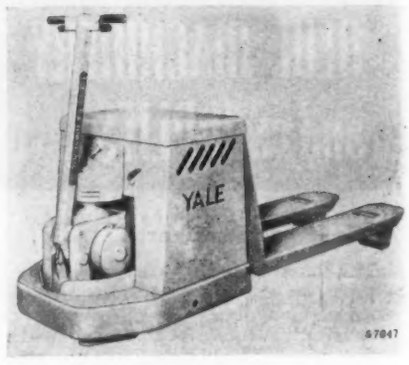
Material withstands temperatures to 1,200 degrees.

and then cut and shaped by face and edge hammers. In tests conducted by the Pittsburgh Testing Laboratory, Foamglas withstood a 24-hour exposure to a temperature of 1,200 degrees F. These blocks are described as strong, lightweight, fireproof, moistureproof and acidproof. They are approved by Underwriters Laboratories, Inc.

One important application of the new material is in the lining and insulation of curing kilns.

● Electric Lift Truck

Recently added to the Yale & Towne Manufacturing Company's line of material-handling machinery is the Worksaver, an electric lift truck with power provided for lifting and locomotion. Dual cam controls, located under the hand bar-grip, are so designed that when finger pressure is released, the motor is

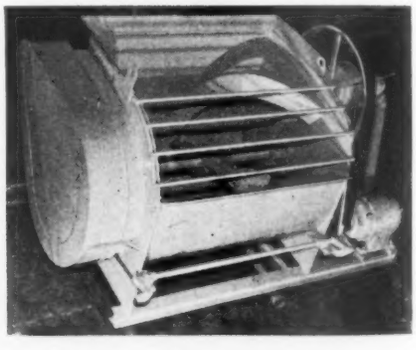


Power is provided for both lifting and locomotion.

shut off and the brakes are applied automatically. Permitting the steering handle to assume a vertical or horizontal position renders the truck immobile.

The Worksaver is available in two types: the platform model, which is designed to handle single-unit loads, or multi-unit loads on skids up to 6,000 pounds; and the pallet model, which will accommodate multi-unit palletized loads up to 4,000 pounds. Both employ a drive motor, located at the base of the steering handle, to operate the hydraulic lift mechanism.

● New Batch Mixer



The Power Equipment Construction Company, Sarasota, Florida, manufactures the heavy-duty concrete mixer pictured above. It is equipped with two spiral blades, hardened liners and precision roller bearings, and is especially designed for use in concrete products plants.

Carmichael Joins Staff Of I. L. Stiles & Son

Chester H. Carmichael, well-known figure in the field of designing and construction of masonry block plants, has joined the staff of the I. L. Stiles & Son Brick Company of North Haven, Connecticut. He will serve as plant manager of the firm's new concrete division. C. F. Andrews will be general manager of the division.

The United States Chamber of Commerce is sponsoring the Construction Industry Advisory Council, to consolidate the construction and building materials industries into a forceful group. The first meeting of the council was scheduled for November 1 in Washington, D.C.

Precast Concrete Co. Builds New Products Plant at Savannah

The Precast Concrete Company of Savannah, Georgia, has announced plans for the construction of a modern plant. Work has been begun on three 75-foot steam curing tunnels and a main building will be constructed after its completion. In addition to the production of concrete blocks precast items such as joists, sills, fence posts and septic tanks will be made.

Willbee-Morse Will Double Floor Space

In anticipation of progressively greater demand for concrete products, the Willbee-Morse Concrete Company of Adrian, Michigan, is now erecting an addition to its plant which will double the present floor space of 5,000 square feet. The 40-year-old firm will also install new equipment to improve its production facilities. All types of concrete masonry units, septic tanks and burial vaults are made by the company.

Plans for extensive plant reorganization will be carried out during the next few months by the Shearman Concrete Pipe Company of Tulsa, Oklahoma. A sheet metal building will replace the present wooden structure and a new pipe machine will be added to the two already in use.

The prevailing methods and types of equipment for producing ready-mixed concrete or concrete products can be found in the Concrete Industries Yearbook.

WANTED

10 S Jaeger Tilt Type Mixers.

AMERICAN WILBERT VAULT CORPORATION

Forest Park — Illinois

FOR SALE

2 BESSER TAMPERS
INQUIRE FOR FURTHER PARTICULARS.

MASSACHUSETTS CEMENT BLOCK CO.
Medford, Massachusetts

FOR SALE
Ready-Mix Concrete Plant

Located in the south in a town with 35,000 pop. Adjoining the largest oil field in U. S. Have $30,000 in contracts. Selling to divide partnership. Price $30,000. Write for further information.

Box No. 11, Pit & Quarry Publications
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FOR SALE
2—STEARNS JOLTCRETE #9 VIBRATING BLOCK MACHINES
2—28 foot STEARNS MIXERS
ATTACHMENTS for 3", 4", 6", 8", 10", and 12" blocks.
STEEL PALLETS for all different blocks.
Approximately 5,000 3", 15,000 4", 5,000 6", 19,000 8", 9,500 12", 2,000 10", STEEL PALLETS.

R. BOWMAN
1500 No. Cameron St. — Harrisburg, Penna.

CONCRETE PRODUCTS PLANT FOR SALE

Established in 1904. Complete in every way. Latest and best equipment for manufacturing concrete culvert pipe, block, drain tile, well curbing, etc. Ten acres of plant site; we own our own gravel tract and washing plant; good location; business well established; wonderful opportunity. Write for descriptive circular.

WETZSTEIN CONCRETE CO.
LAKE VIEW, IOWA

WANTED

Foreman, experienced in Concrete Work and Asphalt Work. Able to read plans and take grades. Please state all particulars as to age, wage, etc.

Box No. 16, c/o Pit and Quarry Publications
538 So. Clark St. — Chicago 5, Ill.

WANTED

A complete Cinder Block plant. The machinery and equipment must be in good condition. Block capacity per day 1000 and up. Write to

★

MAX FERTIK
South Fallsburg, New York

WANTED

Some one with a concrete block or brick plant to move to a location where there is a great demand for building material.

We have processed some fifty thousand yards of pea gravel and plenty of sand, producing more all the time.

Will sell this material at a good price or will allow it used on a profit sharing basis to responsible parties.

LAIN GRAVEL COMPANY
Cleburne, Texas

FOR SALE
About February, 1946

One Besser Super K 3 Tamper Complete, like new; approximately 3500 Steel Pallets; almost 100 Steel Racks; nine different Blocks and Brick Attachments; Power Air Hoist Off-bearer; Clark Lift Truck. Purchased new 1941. Selling all to one purchaser.

LEHIGH BUILDING BLOCK COMPANY
1019 North Quebec Street — Allentown, Pa.

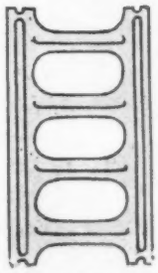
FOR SALE

1 Autocar Truck with Rex Mixer.
1 Mack Truck with Jaeger Mixer.
Condition Good
Available Immediately.

NEW HAVEN READY MIX CONCRETE CO.
375 Mather St. — Hamden, Conn.

Fast — Easy — Profitable

With THIS



COMMERCIAL Cored Steel Pallet

The Perfect Pallet for Vibrators or Tampers

Make THIS

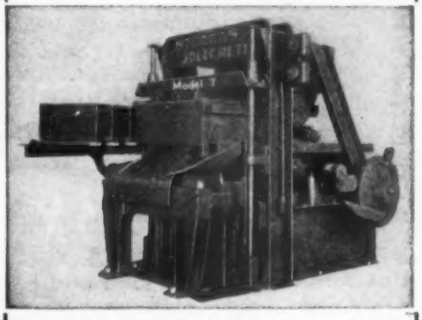
COMMERCIAL Cored Steel Pallets are easily handled, do not warp, break or crack, and insure perfectly cured and shaped block.

Maximum product range and minimum machine expense are assured.

Write for Information

THE COMMERCIAL SHEARING AND STAMPING CO.
Youngstown, Ohio

The Vibration Machine Supreme

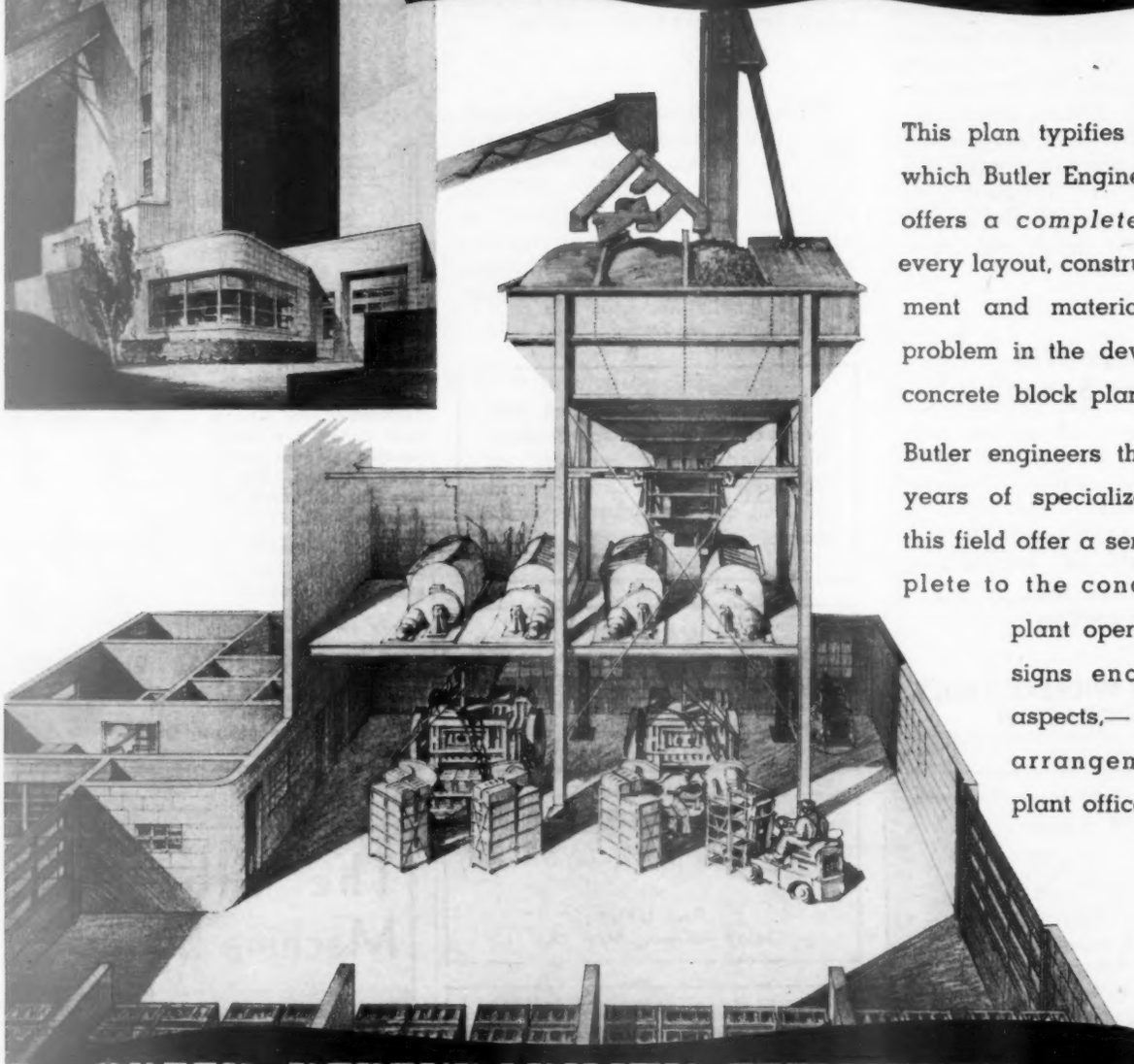


Vibration under pressure — 7,200 blows per minute—and ruggedly built to give long life, the Joltcrete machine is the choice of the wise concrete-products operator. Produces clean-cut, high strength units in any size, and gets the most out of a bag of cement. Built in three sizes with capacities of 7 to 9 standard units per minute.

Hobbs block machines, Anchor tampers, Anchor Jr. strippers, Stearns power strippers and Joltcrete, Stearns mixers and Cast Iron and Press Steel pallets, Straublox oscillating attachments, etc. Repair parts for: Anchor, Ideal, Universal, Stearns, Blystone mixers and many others.

ANCHOR CONCRETE MACHINERY CO.
G. M. Friel, Manager — Columbus, Ohio

WILL THIS BE *Your* PLANT?



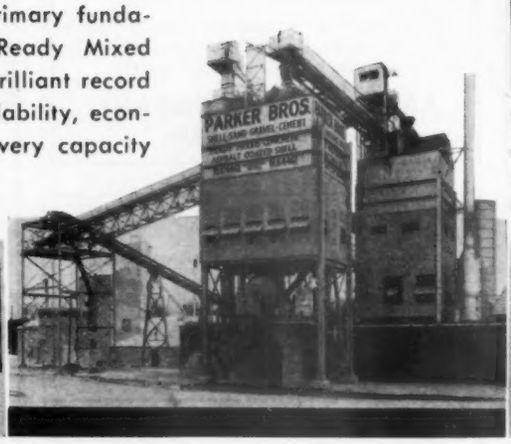
This plan typifies the way in which Butler Engineered Design offers a *complete* solution to every layout, construction, equipment and materials handling problem in the development of concrete block plants.

Butler engineers through many years of specialized study in this field offer a service so complete to the concrete block plant operator that designs encompass all aspects,—even to the arrangement of the plant office.

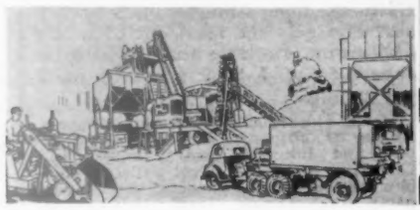
SPEED-DEPENDABILITY-EFFICIENCY, *with*

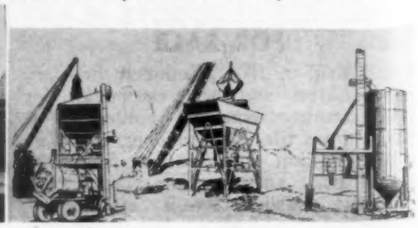
Engineered BUTLER *Design*

Butler Engineered Design as a primary fundamental in the construction of Ready Mixed Concrete Plants has a long and brilliant record in providing the utmost in dependability, economy and efficiency in meeting every capacity requirement.



Butler provides much more than a plant; the organization provides a production plan with maximum profit to the operator.





BUTLER BIN CO.

WAUKESHA, WISCONSIN

SEALED TOP-LOADING DRUM

OR END-LOADER

2, 3 and 4½ yd. sizes — We also build LOW CHARGE type truck mixers in 2 to 8 yd. sizes.

You can have your choice in JAEGER "HI-DUMP" Speed Merchants

Specially recommended for wet-mix concrete, Jaeger Sealed Drum Top-Loaders are also highly efficient for other types of plant. Load in one drop thru the top — the fastest method, which also insures the proper distribution of materials and the void space needed for fast, thoro mixing in the drum. The sealed drum holds heat in winter, protects the concrete from bad weather, and in combination with "Slow" mixing thru Jaeger's 2-speed transmission, maintains the predetermined slump of the material on long hauls.

Jaeger also offers the fastest charging and discharging End-Loader on the market with gated hopper having fixed seal equipped for one-shot pressure lubrication . . ALL HI-DUMP Speed Merchants have Jaeger's revolutionary improvements — water tank on main frame, always-faster water distribution thru high pressure pump and positively clog-proof jet, transmission and center drive in lifetime alignment, streamlined enclosed front end and die-shaped mixing and "Throw-Back" blades which give unequalled mixing and speed of discharge.

Ask your Jaeger distributor or write us for complete new Catalog TM-5.

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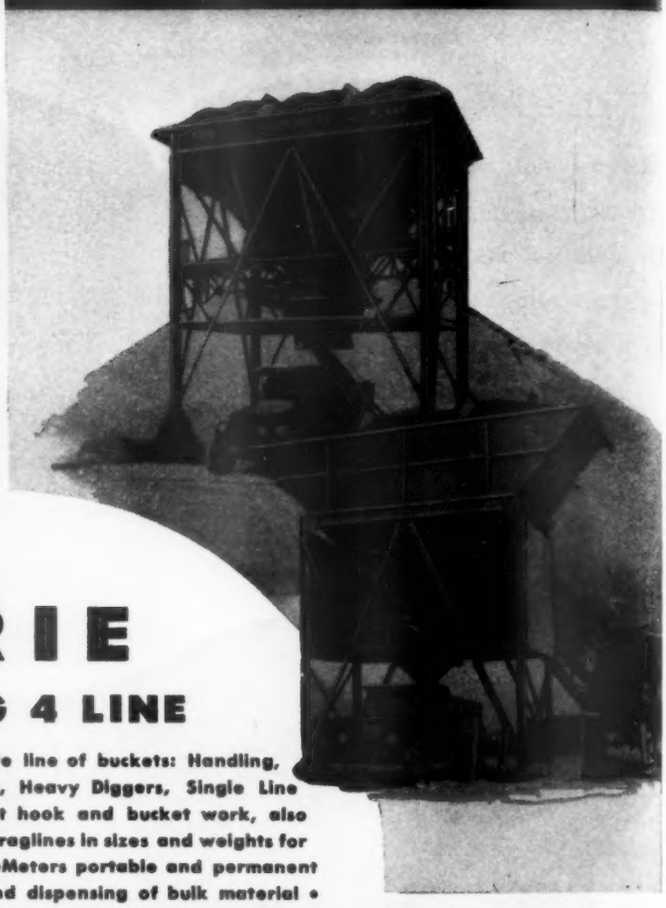

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THE BIG 4 LINE

ERIE builds the most complete line of buckets: Handling, Rehandling, Light Diggers, Heavy Diggers, Single Line Hook-On type for intermittent hook and bucket work, also Strayer-Electric Hook-on and Draglines in sizes and weights for the job and crane. • Erie AggreMeters portable and permanent types for storing, measuring and dispensing of bulk material • Erie Portable Concrete plants that move to the job to make up to 40 yards of specification concrete close to the concrete forms, and Erie Overhead Cranes, custom-built to meet any demand from 5 to 40 tons capacity—welded or riveted plain or roller bearing types. For ready reference, write for condensed catalog.

ERIE STEEL CONSTRUCTION CO.

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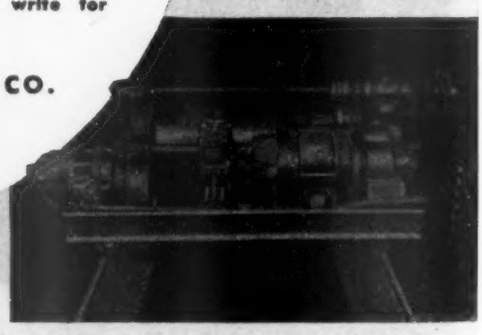

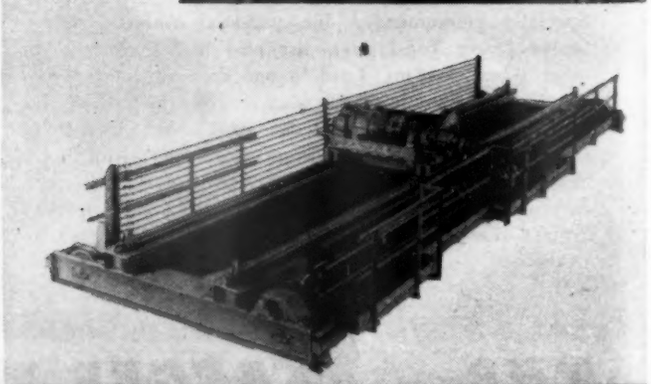

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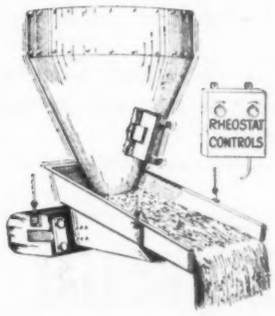
OVERHEAD CRANES

Having Material Handling Troubles?

Investigate

SYNTRON Controlled "Vibration"



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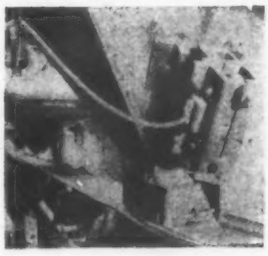
ELECTRIC VIBRATORS

FOR PLUGGED AND ARCHED BINS, HOPPERS AND CHUTES

3600 powerful vibration per minute down arching and plugging—assure a steady, free flow of materials.



"Vibra-Flow"

VIBRATORY FEEDERS

RHEOSTAT CONTROL OF RATE OF FEED

Controlling the feed of various materials to grinders, crushers, dryers, belt conveyors, etc. Capacities from OUNCES to 500 TONS per hours.

Write for catalog data.

SYNTRON CO.

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NOW!

An *Electric* LIFT-TRUCK for less than $1,000!

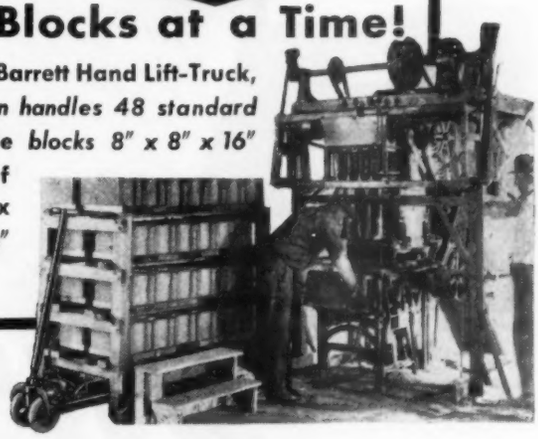
No longer must you choose between "muscling" your concrete over those long hauls or going in for big, high-cost power trucks. Less than $1,000 now brings you the new Barrett PowerOx, a combination of hand lift and electric drive that takes any load up to 4,000 lbs.—cuts time and effort to a minimum!

Loads are raised with a few short strokes of the PowerOx handle. Forward and reverse motion is electric . . . controlled entirely by push buttons. Automatic brake, dual motors, rear wheel drive. Ask a Barrett engineer to show you how quickly a PowerOx pays for itself—or write for full details!

For Short Hauls—the BARRETT HAND LIFT-TRUCK

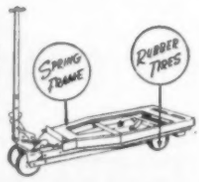
48 Blocks at a Time!

With a Barrett Hand Lift-Truck, *one man handles 48 standard concrete blocks 8″ x 8″ x 16″* (or 32 of the 8″ x 12″ x 16″ size).



"SOFT" HANDLING ASSURED!

Shock-reducing rubber tires and super-spring frame assure your blocks a soft ride from machine to curing room and right through storage. Write for descriptive circular!



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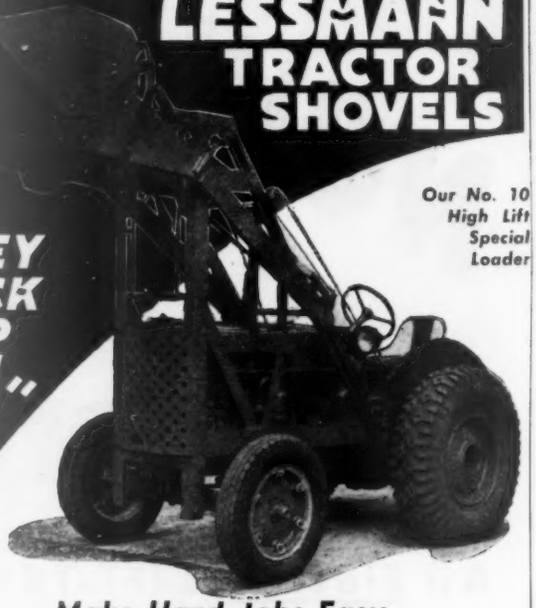
Barrett Handling Equipment

BARRETT

ONE MAN DOES MORE THAN 3 OR 4 . . . WITH A BARRETT

LESSMANN TRACTOR SHOVELS

"THEY PICK UP and GO"



Our No. 10 High Lift Special Loader

Make Hard Jobs Easy

LESSMANN Equipment is scientifically engineered and built as a unit. Engineering know-how gained from 27 years of tractor shovel manufacturing guarantees LESSMANN superiority. 100% more powerful. 100% easier to operate. Compare LESSMANN with other front end shovels. Study the tractor gear ratios, the steering gear, axle widths, tire equipment, loading height, size of shovels and other important factors. See for yourself why LESSMANN is the leader — why LESSMANN IS THE BUY! Write today for illustrated literature, prices, etc.

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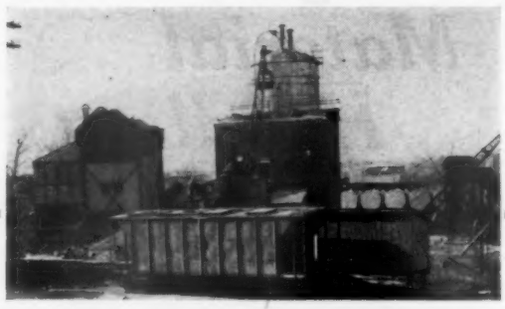

1. Buy in BULK
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3. Use the ROBINSON AIR-ACTIVATED SYSTEM

There's no need to tell you about the advantages of buying cement in bulk. So, we'll skip to Reason No. 2 . . . Handle bulk cement by air. It's faster, cleaner and more flexible. It involves less maintenance. As for Reason No. 3 . . . The ROBINSON CONVEYING SYSTEM "floats" rather than blasts the cement through the pipe. It has high capacity over long distances, up steep grades and around bends. It has no continuously moving parts such as gears, screws, shafts or bearings.

Bulletin 310 gives further details. Write for a copy.

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This Book... REVOLUTIONIZED MATERIAL HANDLING

...it defined and crystallized the unit packaging method

The publication of this book started men of industrial plants and railroads thinking along new lines.

Out of this book stemmed the material handling principles and methods that have enabled the Army and Navy to successfully handle in this war the burden of supplies, munitions and equipment.

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America's Finest Molds and Lowering Device

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Advertise your wants and surplus equipment in

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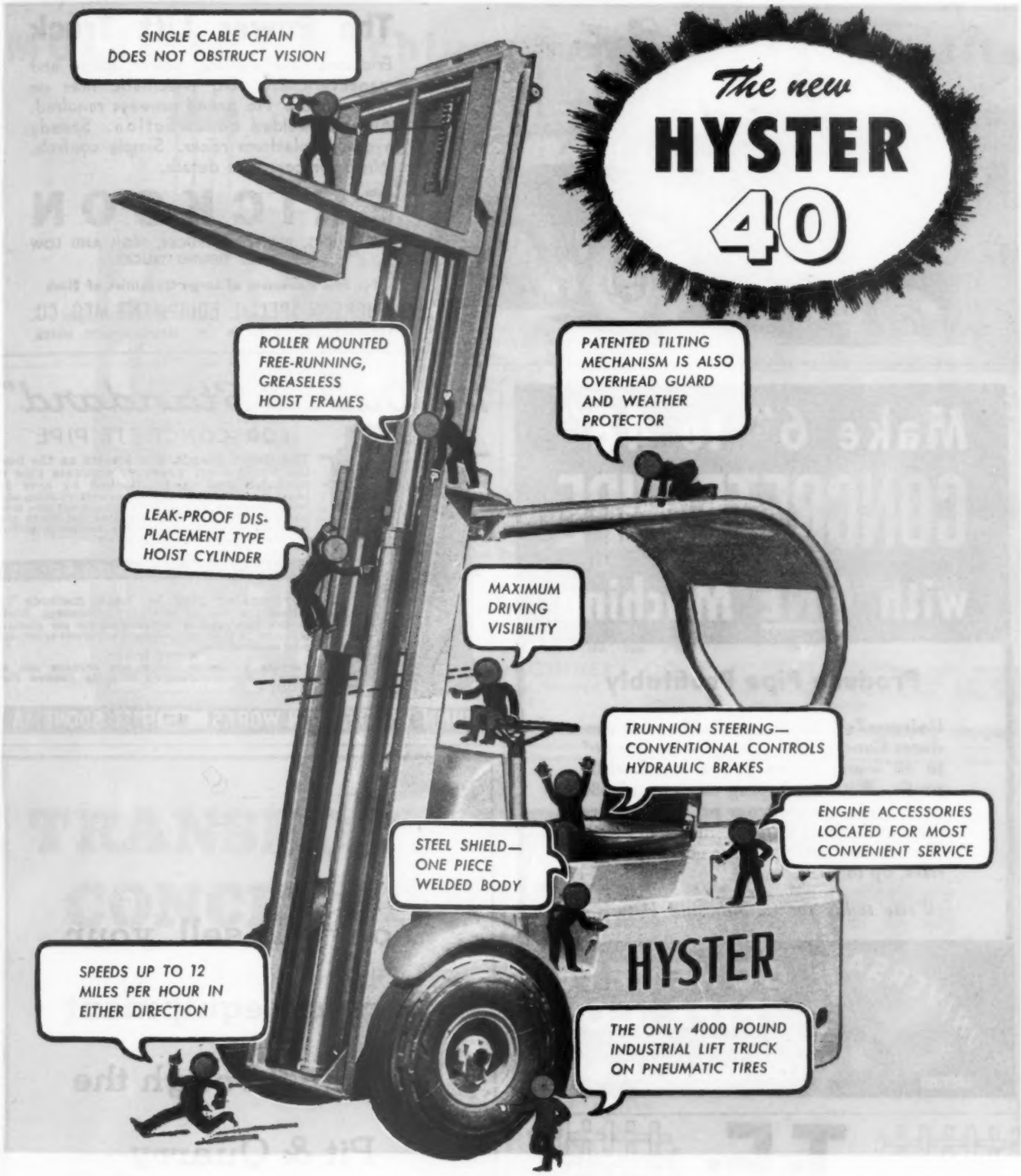
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The new HYSTER 40
ROLLER MOUNTED FREE-RUNNING, GREASELESS HOIST FRAMES
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SPEEDS UP TO 12 MILES PER HOUR IN EITHER DIRECTION
THE ONLY 4000 POUND INDUSTRIAL LIFT TRUCK ON PNEUMATIC TIRES

ANOTHER NEW HYSTER PROFIT-MAKER FOR YOUR BUSINESS!

A 4000-pound Industrial Lift Truck on pneumatic tires!

The new Hyster "40", with 2-ton lifting, transporting, stacking capacity *has the ability to solve 7 out of every 10* materials handling problems in the average business . . . Pneumatic tires for fast, smooth work, indoors and outdoors. Gasoline powered. Powerful, efficient hydraulic lifting mechanism. Many new engineering improvements. Easy to operate. Easy to service.

The new Hyster "40" is fully illustrated and described in Bulletin 1016. Write for your copy.

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Ericksons have stamina, power, speed and maneuverability. Big pneumatic tires on drive wheels. No paved runways required. All steel welded construction. Speedy hydraulic platform raiser. Simple controls. Write for complete details.

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LIFT TRUCKS, PLATFORM TRUCKS, HIGH AND LOW LIFT FORK TIERING TRUCKS.

For Fast Movement of Large Quantities of Block

ERICKSON SPECIAL EQUIPMENT MFG. CO.

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Make 6" to 48" CONCRETE PIPE with ONE Machine

Produce Pipe Profitably

Universal's "All-Purpose" Machine produces Concrete Pipe in all sizes from 6" to 48"—and shows you a worth-while profit. With a tamping capacity of 680 strokes per minute, your product is more dense, durable, finished in appearance. We can also outfit you for making larger sizes, up to 135".

Write today for Catalog and Details.

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Columbus 15, Ohio

The "Quinn Standard"

FOR CONCRETE PIPE

The Quinn Standard is known as the best the world over, wherever concrete pipe is produced and used. Backed by over 30 years' service in the hands of hundreds of Quinn-educated contractors, municipal departments and pipe manufacturers who know from experience that Quinn pipe forms and Quinn mixing formulas combine to produce the finest concrete pipe at lowest cost.

Quinn Heavy Duty Pipe Forms

For making pipe by hand methods by either the wet or semi-dry processes. Built to give more years of service—sizes for any diameter pipe from 12 to 84 inches—tongue and groove or bell-end pipe at lowest cost.

WRITE TODAY

Complete information, prices and estimates sent on request. Also manufacturers of Quinn Concrete Pipe Machines.

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Woven Wire SCREENS

Half-Century of Dependability

For ACCURACY ENDURANCE ECONOMY

SQUARE OPENING
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Standard and Special Weaves

TWIN CITY IRON & WIRE CO., St. Paul, Minnesota

You will sell your Surplus equipment Faster through the Pit & Quarry Broadcast Section

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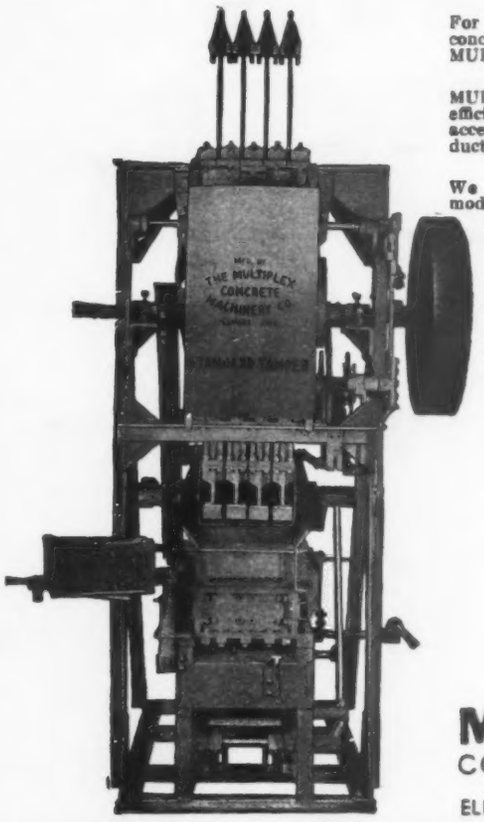
MULTIPLEX Machines For Postwar Profits



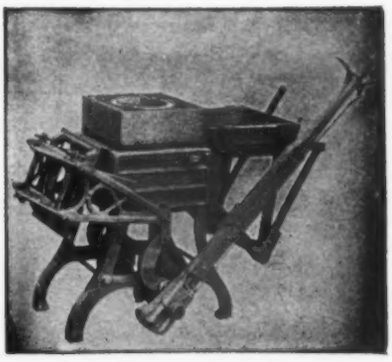
For a Quick "Take-Off" and sustained pace in concrete block output, reserve one of the MULTIPLEX *high-speed* machines.

MULTIPLEX offers a wide variety of super-efficient mixing equipment, with all types of accessories necessary for economical mass production.

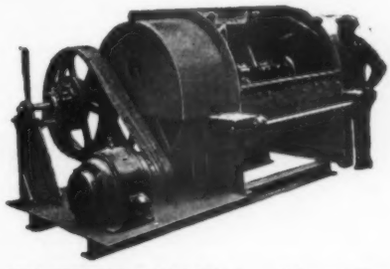
We can recommend MULTIPLEX units for modernizing *your* plant and enlarging its capacity.

Our universal type MULTIPLEX Standard Tamper for making plain and stripper, or face blocks, on one base. Easily convertible as business expands. Supplied with 4-bar or 8-bar tamper, either power or hand operated.

Write for Booklet describing the MULTIPLEX complete line of concrete mixing equipment, including Double and Single Hand Press Strippers, Power Press Strippers, and Super-Tampers.



The MULTIPLEX Flue Block Machine makes ventilated, solid or lightweight units, including all attachments for ventilator and stove pipe openings.



MULTIPLEX Multi-Mixer with reverse screw-type action insures fast and thorough mixing of every batch. Side, end or bottom discharge.

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CONCRETE MACHINERY CO.
Frank Muenzer, President
ELMORE • OHIO

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PLANT MIXERS 10-24-36 CUBIC FOOT CAPACITY
KIRKHAM VIBRATOR BLOCK MACHINE
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MATERIAL ELEVATORS
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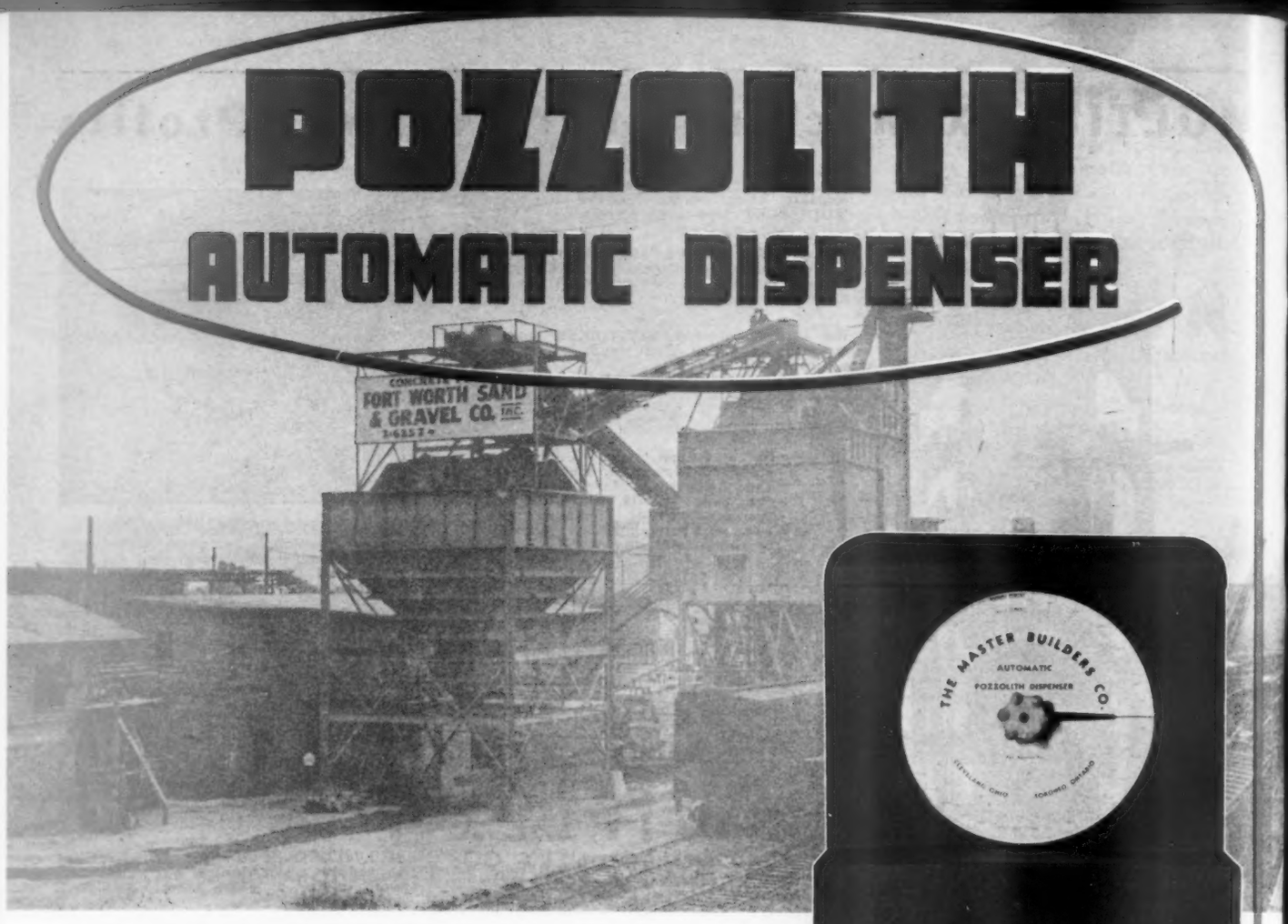
POZZOLITH
AUTOMATIC DISPENSER



This device delivers the exact amount of Pozzolith required for a batch by simply setting the control dial and pushing the button.

GREAT FORWARD STEP IN CONCRETE CONTROL

MANY important ready-mixed and batching plants are using the Pozzolith Automatic Dispenser to produce concrete with as much as 500% greater durability and with *increased* strength, exactly the right workability for the job, and 50-60% less bleeding than with plain concrete.

Leading authorities confirm the judgement of these plants, *that to obtain the best results admixtures should be added at the mixer and not interground.**

The Pozzolith Automatic Dispenser will be of special value to your plant if you have only one cement bin and the handling of special cements involves extra expense, or if you desire to use only one type of cement, since Pozzolith added to normal Portland cement produces concrete with high-early, waterproof and other special properties.

Write and we shall be glad to send you complete information on how to modernize your technique in concrete control with the Pozzolith Automatic Push Button Dispenser.

*J. W. KUSHING—ROADS and STREETS, Dec. 1941.

F. H. JACKSON — Principal Engineer of Tests, Div. of Physical Research, Public Roads Administration — PUBLIC ROADS, Vol. 24, No. 4, Pages 108, 109.

CHAS. E. WUERPEL — Engineer-in-Charge, Central Concrete Laboratory, Corps of Engineers U. S. Army, Mt. Vernon, N. Y.— CRUSHED STONE JOURNAL, June 1945, Page 13.

CHAS. E. WUERPEL — A.C.I. JOURNAL, Sept. 1945, Page 81.

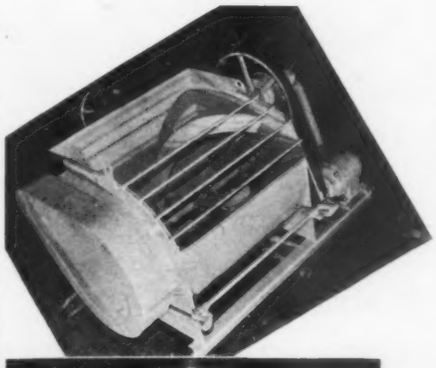
STANTON WALKER — Engineering Director National Sand & Gravel Ass'n. and National Ready Mixed Concrete Ass'n.— CONCRETE, Nov. 1945, Page 19.

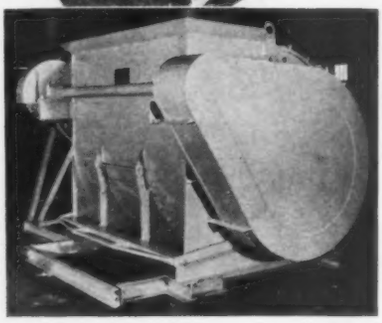
THE MASTER BUILDERS COMPANY

CLEVELAND 3, OHIO • TORONTO, ONTARIO

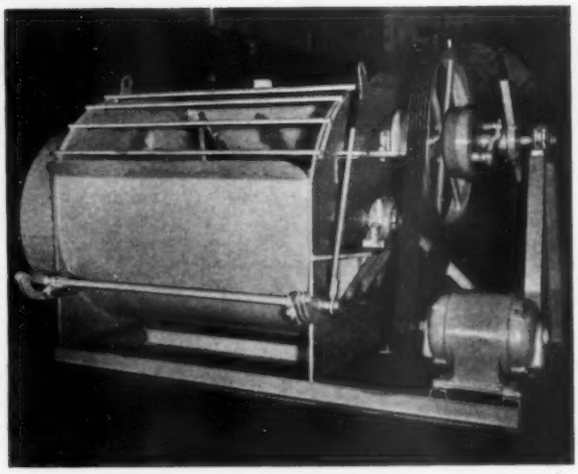
MASTER BUILDERS

Answers YOUR Need!





This powerful, heavy-duty CONCRETE MIXER is equipped with two spiral blades, hardened liners and precision roller bearings . . . capable of meeting every production requirement in the efficient operation of your Block Plant.



Shipment in 2 Weeks

Dealer Territories Available

after receipt of order

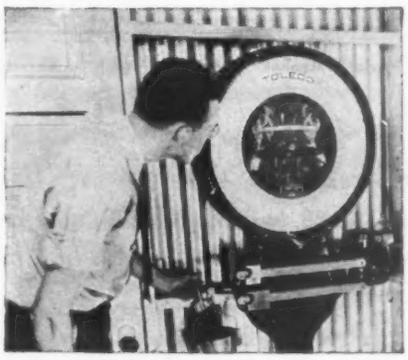
POWER EQUIPMENT CONSTRUCTION CO.

PAYNE TERMINAL, P. O. Box 472, SARASOTA, FLORIDA

For UNIFORM Concrete, Specify [SC]² PRECISION CONCRETE CONTROL

[SC]² CONTROL uses precision, scientific equipment for the production of concrete in ordinary batching plants, both project and ready-mix.

In DRY-BATCHING operations the correct DRY weight of wet aggregates, and cement, is delivered and the exact amount of water to be added at the mixer is shown on each batch ticket.



The [SC]² Moisture Meter. The only unit capable of determining moisture content in one minute.

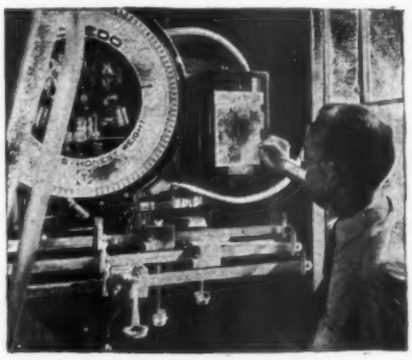
[SC]² CONTROL Provides:

MOISTURE DETERMINATIONS, accurate to ¼% made in one minute; one for every batch when necessary.

AUTOMATIC COMPENSATION FOR MOISTURE CONTENT in fine and coarse aggregates. Does not require calculations, charts or tables. With it, any intelligent weighman can produce remarkable uniformity.

PRECISION PROPORTIONING OF ALL INGREDIENTS using TOLEDO, the world's most accurate scales. Automatic cut-off is used for cement and water and is optional for aggregates.

AUTOMATIC GRAPHIC OR PRINTED RECORDS OF EVERY BATCH showing the delivered weight of each ingredient. Insures delivery of specified quantities.

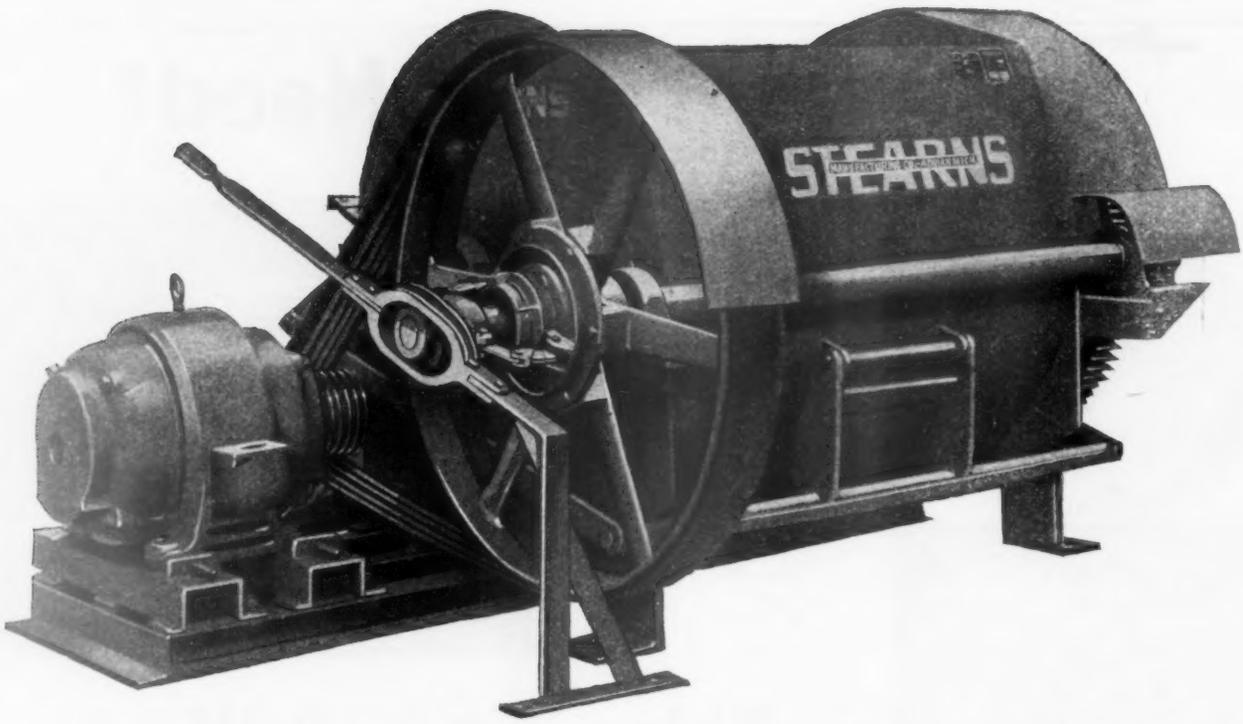


The [SC]² Compensator Batching Scale which compensates for the moisture content of aggregates and graphically records every weighing operation.

[SC]² CONTROL is approved by every concrete engineer, ready-mix plant operator and contractor who has ever used it. Write TODAY for our folder on batching plant performance and information on how CONTROLLED CONCRETE can be fairly specified.

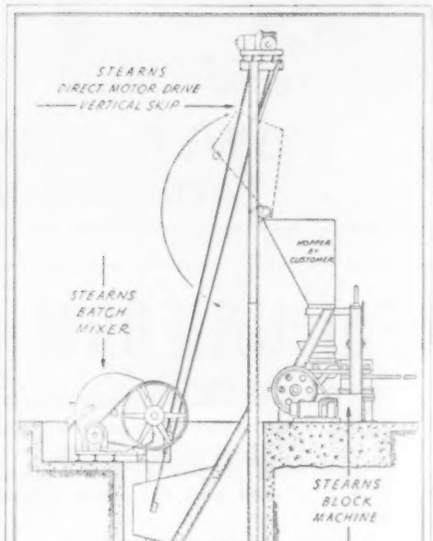
Scientific Concrete Service Corporation

724 Salem Avenue, Elizabeth 3, N. J.



for Fast, Thorough, ECONOMICAL Mixing buy a STEARNS

● *Outstanding advantages* include Bar Type Liners that are quickly shifted, easily removed, wear-resistant . . . *Adjustable Mixing Blades* made of long-life "Sterloy" . . . *Door Control* and handy *Bag Shelf* are conveniently located—save time and waste motion . . . *Discharge Door*—quick opening, positive closing, tight locking . . . *Bearings:* self-aligning, anti-friction, moisture and dust-proof . . . *Drums* are of steel plate welded to heavy heads.



Typical Stearns Installation with mixer below floor level.

● *Available* now in five (5) sizes: 12, 18, 24, 42 and 50 cubic foot capacities with pulley, V-belt or Gear-head motor drive.

New Mixer Folder illustrating and describing these machines will be mailed upon request.

Performance
Speaks Louder than Words
(ASK ANY STEARNS OWNER)

A Few of Hundreds:

CINDER BLOCK, INC., Salt Lake City, Utah
Two Stearns Mixers

AEROCRETE CONSTRUCTION CO.
Montreal, Que., Canada
Two Stearns Mixers

BRISTOL CINDER BLOCK CO.
Bristol, Virginia
Two Stearns Mixers

STEARNS
GENE OLSEN, PRESIDENT

Designers and manufacturers of vibration and tamp-type block and brick machines . . . Mixers . . . Skip Loaders. Licensed under the Gelbman Vibration Patents.

Macks Beat Locomotives

IN THIS MODERN QUARRY OPERATION!

THE JOB: *Hauling rock in the South Bethlehem quarry of the Callanan Road Improvement Company.*

THE OLD WAY: *Steam locomotives and tipple cars.*

THE NEW WAY: *Mack EHT's and Easton semi-trailers with tipple bodies.*

THE ADVANTAGES: *(From a letter from Keith M. Callanan, Vice-President)*

No more track moving cost. With locomotives, track had to be moved after every cut so that material from the next cut could be loaded.

No more track cost and delay when making primary well drill shots. Formerly track had to be moved from face of quarry before making well drill shot, then replaced, before operations could begin. Result: delays up to 2 days, high labor costs. With Macks, an old shot is finished, the new blast laid and hauling begins within a few minutes.

Flexibility in digging. With railroad system, shovel was always hemmed in on one side by the track; was therefore held up when bottom was hit or bad digging encountered. With trucks, shovel is moved to another pit and production continues without interruption.

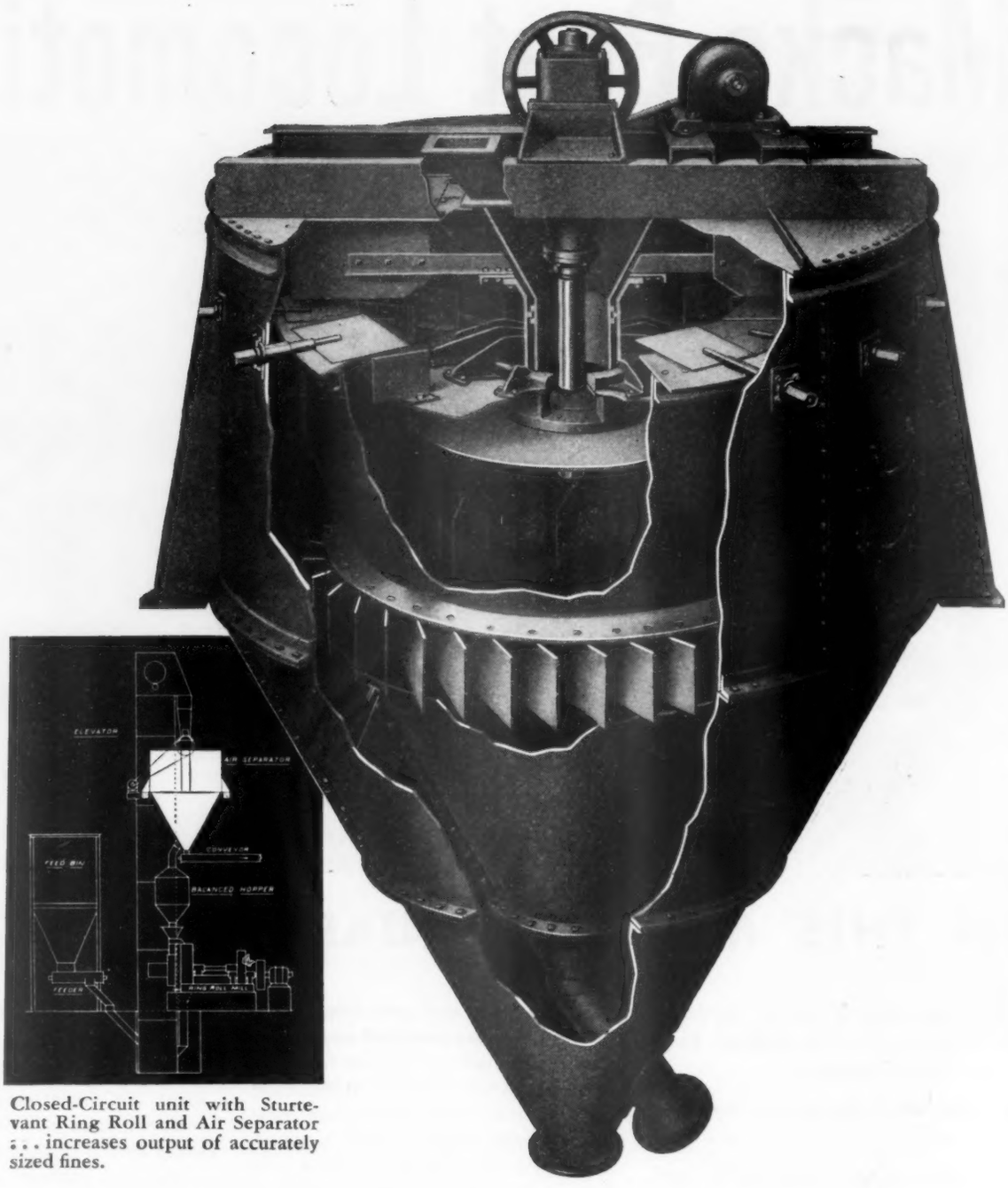
Easier maintenance. Steam had to be kept up in locomotives all through the night and over week ends. In cold weather, pipes and water lines sometimes froze. Trucks eliminate all this bother and expense, are always ready for work in the morning.

THE IMPORTANCE FOR YOU:
There may be a job in your mining or quarrying operations where the use of Mack Trucks would save time, money and trouble. Why not discuss it with your local Mack dealer? He's qualified and eager to help.

Mack Trucks, Inc., Empire State Building, New York 1, N. Y. Factories at Allentown, Pa.; Plainfield, N. J.; New Brunswick, N. J.; Long Island City, N. Y. Factory branches and dealers in all principal cities for service and parts.

Mack
TRUCKS
FOR EVERY PURPOSE

Performance Counts



Closed-Circuit unit with Sturtevant Ring Roll and Air Separator . . . increases output of accurately sized fines.

STURTEVANT AIR SEPARATORS

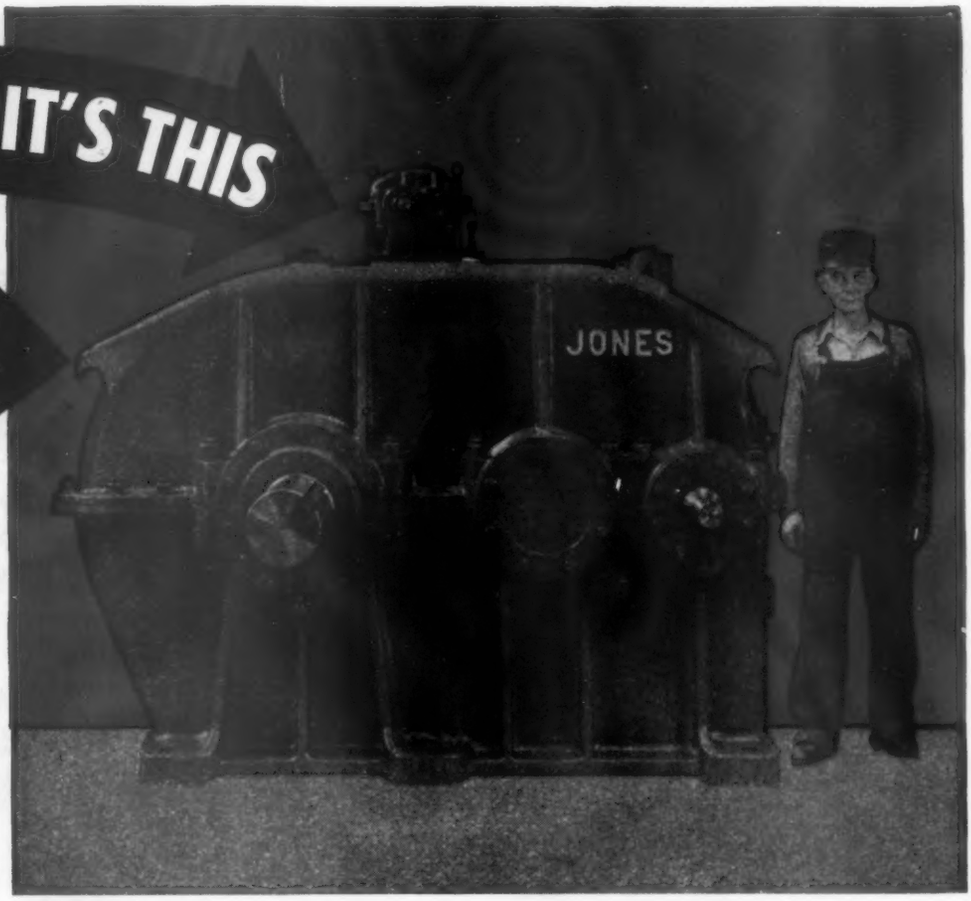
Up Production of Fines . . . Provide More Uniform Fines . . . at Lower Cost per Ton

Do your requirements call for accurate separation of fines . . . at increased production rates . . . at lower costs—then you should investigate the Sturtevant Centrifugal Air Separators. These efficient separators may be used for removing dust from materials already milled or in their natural state . . . or in a "closed-circuit" with a grinder where they separate and remove the finished product from the pulverizer.

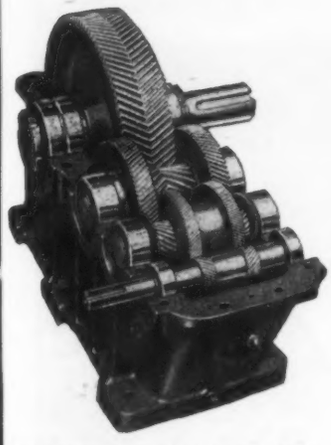
Sturtevant Air Separators are easy to operate. Quick, simple adjustments provide a range of fineness from 40 to 350 mesh. They increase finished product output up to 300% . . . cut power costs as much as 50%. Sturtevant Air Separators are the only separators quickly adjustable to meet all requirements for accurate separation under all conditions. They are available in capacities from ¼ ton to 50 ton per hour. Write for complete information and bulletin 087, today.

STURTEVANT
MILL COMPANY
42 Harrison Square, Boston 22, Mass.
Designers and Manufacturers of
CRUSHERS • GRINDERS • SEPARATORS • CONVEYORS
MECHANICAL DENS and EXCAVATORS • ELEVATORS • MIXERS

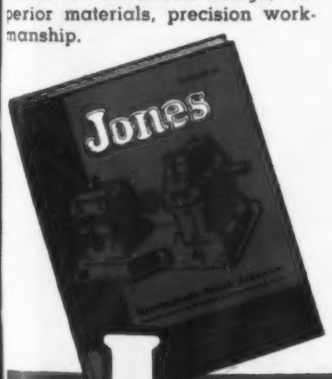
WHETHER IT'S THIS —OR THIS



. . . both will stand up under war time conditions



The above view of a Jones Triple Reduction Herringbone Speed Reducer is typical of a line that is noted for advanced design, superior materials, precision workmanship.



TWENTY FOUR hours a day operation plus loading up to rated capacity or beyond are testing speed reducers in every type of service.

Jones Herringbone Speed Reducers are establishing remarkable service records under these conditions. One reason of course is the fact that Jones Reducers have always been rated in accordance with the recommended practice of the American Gear Manufacturers Association.

With this conservative rating policy goes sturdiness, compactness, symmetry and balance—all factors that influence maximum efficiency, long life and improved performance.

Jones Herringbone Gear Speed Reducers are built in a wide range of ratios and ratings to cover every requirement. Single (Type SH) reducers in standard ratios range from 1.25 to 1 up to 11 to 1 in ratings from 1.3 to 440 H.P. Double (Type DH) reducers are built in standard ratios from 10.9 to 1 up to 72 to 1 in ratings from 0.5 to 275 H.P. The triple reduction reducers (Type TH) cover a range of ratios from 86.9 to 1 up to 355.8 to 1 in ratings from 0.3 to 78 H.P.

All these reducers have heat treated gears, ground shafts and are mounted with anti-friction bearings throughout. Cast iron bases are available for all variations of motor assembly.

For complete information on both standard and special applications of Jones Herringbone Reducers ask for Catalog No. 70. This 128 page catalog is a comprehensive technical treatise on the whole subject of Herringbone Reducer application for all conditions of service. If you have any type of drive problem that might call for Herringbone gears we shall be pleased to send you a copy.

W. A. JONES FOUNDRY & MACHINE CO., 4441 Roosevelt Road, Chicago, Ill.

Jones

HERRINGBONE — WORM — SPUR — BEVEL SPEED REDUCERS • PULLEYS
CUT AND MOLDED TOOTH GEARS • V-BELT SHEAVES • ANTI-FRICTION
PILLOW BLOCKS • FRICTION CLUTCHES • TRANSMISSION APPLIANCES

HOISTS • BODIES • WINCHES
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There IS a Reason
Gar Wood—World's Largest Manufacturer of Truck and Trailer equipment—earned this leadership through ability to engineer and build units of such outstanding performance that men who know equipment best specify Gar Wood.
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GOVERNMENT SURPLUS STEEL

AVAILABLE NOW THROUGH RFC

Liberal Price Reductions

This is an unusual opportunity for many manufacturers to get ahead in their reconversion program. While some of the sizes, shapes and alloys of the RFC stock of surplus steel may differ from the specifications of normal industry requirements, it has the advantage of being quickly available.

Attractive allowances have been made in our pricing program to move this steel into the hands of private industry.

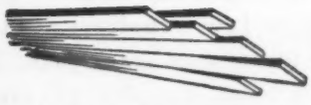
HOT ROLLED PLATES

Carbon and Alloy. Wide range of sizes from ¼" to 6" thick, up to 96" wide.

TOOL STEEL

7,000 tons. In Water-hardening, Oil-hardening and High Speed grades. Large range of bar sizes.

STRIP STEEL



Available in Hot Rolled and Cold Rolled, Carbon and Alloy. Large quantity of High Carbon Cold Rolled Strip—to be sold at low Carbon prices—or lower. Large range of sizes.

BAR STEEL

Hot Rolled and Cold Finished in both Carbon and Alloy. Rounds, squares, flats and hexagons in various specifications. Many items in large quantities.

Write, wire or phone your requests to the nearest RFC agency listed below for more detailed information. If you desire, credit terms can be arranged. If your local office does not have all the materials you need, it will endeavor to locate them from other offices throughout the country.

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Miscellaneous STEEL PRODUCTS

1. Carbon and Alloy Billets, Blooms, Slabs, Skelp, Rods, etc. . . . ☐
2. Reinforcing Bars . . . . . ☐
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4. H. R. & C. R. Sheets, Strip Steel, Carbon and Alloy . . . . . ☐
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Firm.....

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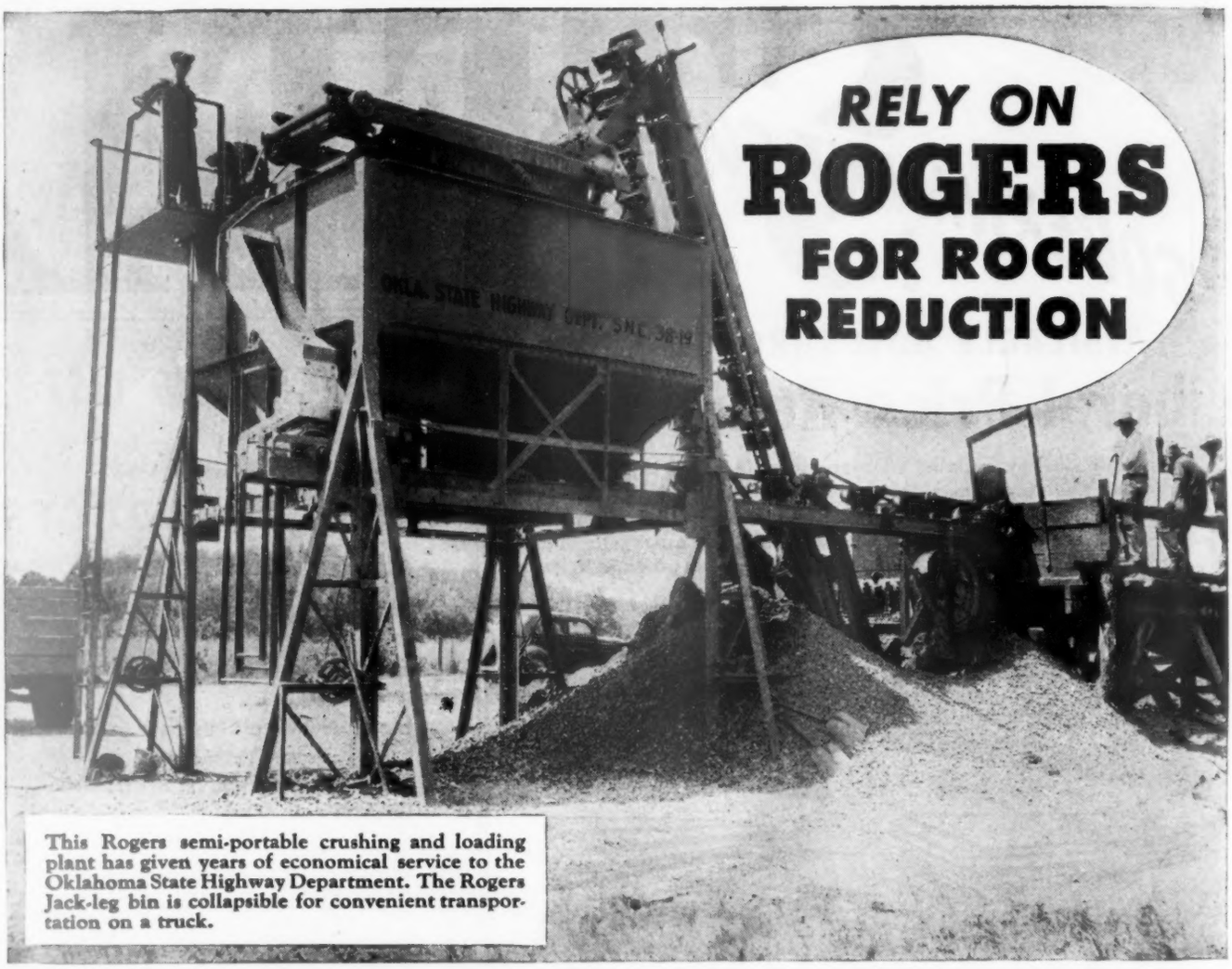
RECONSTRUCTION FINANCE CORPORATION

A Disposal Agency Designated by the Surplus Property Administration

Agencies located at: Atlanta • Birmingham • Boston • Charlotte • Chicago • Cleveland • Dallas • Denver Detroit • Helena • Houston • Jacksonville • Kansas City, Mo. • Little Rock • Los Angeles • Louisville Minneapolis • Nashville • New Orleans • New York • Oklahoma City • Omaha • Philadelphia Portland, Ore. • Richmond • St. Louis • Salt Lake City • San Antonio • San Francisco • Seattle • Spokane

157-1

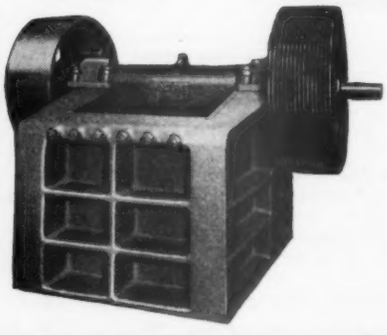


RELY ON
ROGERS
FOR ROCK
REDUCTION

This Rogers semi-portable crushing and loading plant has given years of economical service to the Oklahoma State Highway Department. The Rogers Jack-leg bin is collapsible for convenient transportation on a truck.

EQUIPMENT FOR CRUSHING...SIZING...CONVEYING...STORING

Rogers offers a complete line of rock reduction equipment – every piece built to the highest standards of performance, strength and reliability. When you "Rely on Rogers" for your equipment, you can be certain that no part of your operations will be handicapped by the failure of one link in the process. The extra strength and extra capacity built into every Rogers crusher mean greater production at a lower operating and maintenance cost.

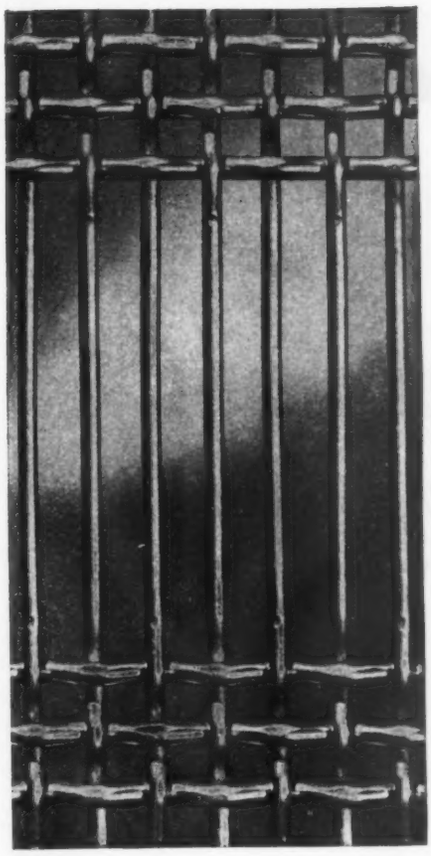


Rogers jaw crushers available in 16 sizes are so sturdily built that, despite greater capacity, there has never been a shaft or bearing failure reported in a Rogers.

ROGERS IRON WORKS CO.

JOPLIN, MISSOURI

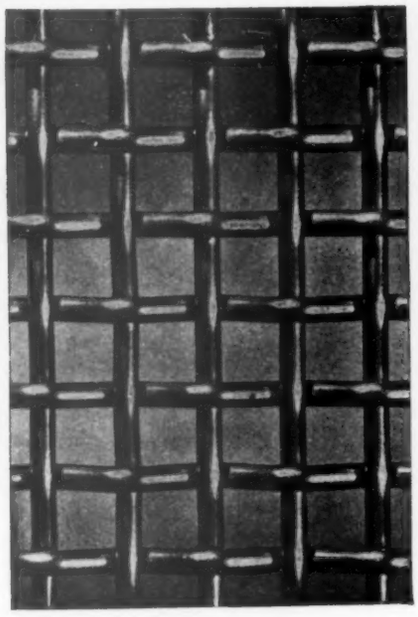
Quarry Plants • Gravel Plants • Jaw Crushers • Roll Crushers • Belt Conveyors • Bucket Elevators • Screens • Feeders • Steel Bins



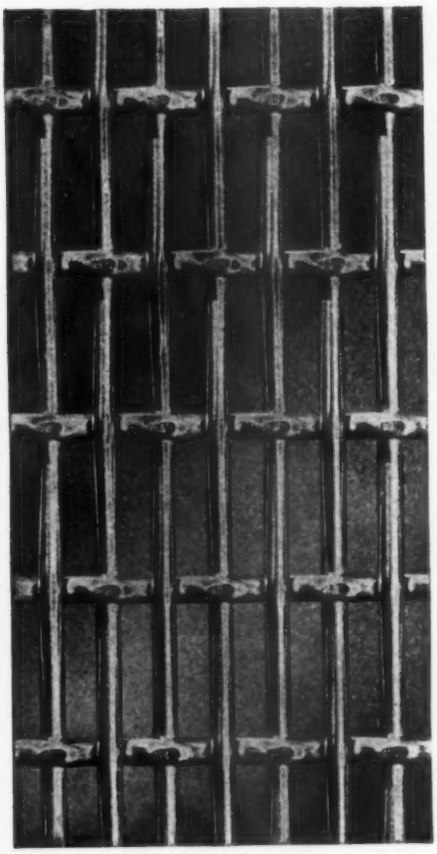
Ty-Rod Screen

First in Accuracy, Capacity and Durability!

Tyler Woven Wire Screens



Square Mesh

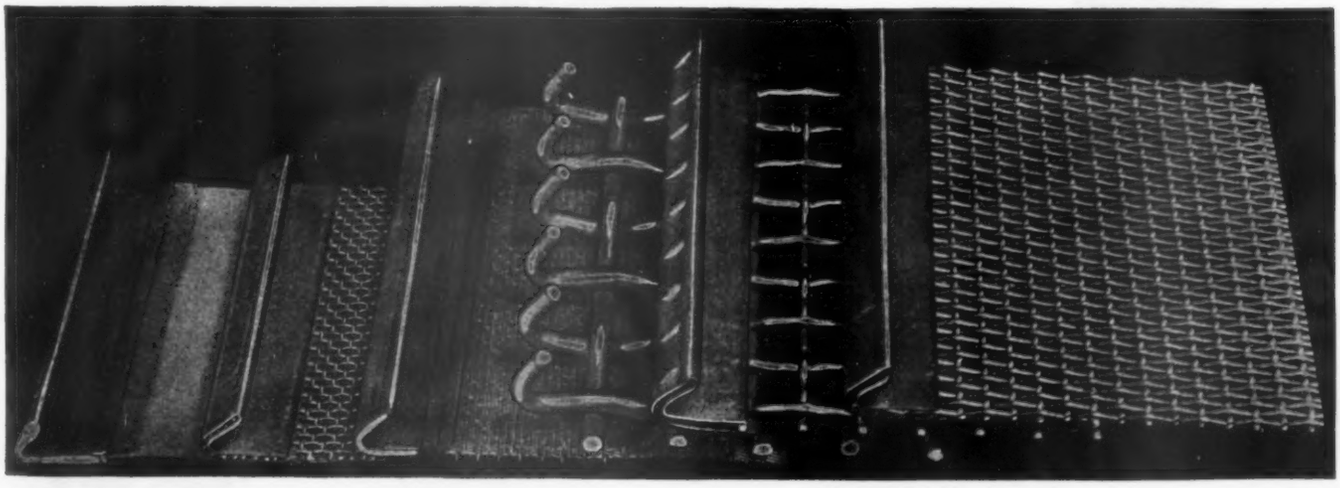


Ton-Cap Screen

Tyler Screen Sections for All Makes of Screening Machines!

Screen sections of Tyler Woven Wire are fabricated for all makes of vibrating screens in any mesh metal. They are made up with hook-strip or bent-edge construction to suit the machine on which they are to be used.

Tyler hook-strips make possible stretching and maintaining the screen surface at drum-head tension, which is essential for successful screening and long screen life.



THE W. S. TYLER COMPANY

Cleveland 14, Ohio • U.S.A.

Woven Wire Screens • Screening Machinery • Testing Sieve Equipment

LIKE A CHAMPION FENCER

FORM-SET ROPE IS *Relaxed*

Study the fencer's movements. Watch him in action. He's graceful, agile, light on his feet. Muscles flow freely. There's nothing about him suggestive of tension. He's learned to *relax* while engaged in a contest of skill and endurance.

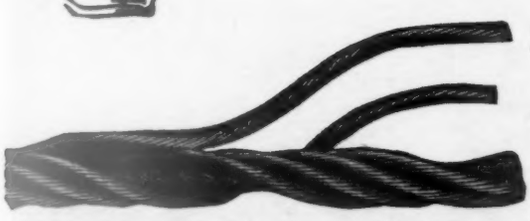
In Bethlehem's Form-Set rope, you'll find much of that same relaxed effect—a quality that pays heavy dividends.

Every wire and strand of Form-Set rope is preformed into a permanent helical shape before being laid in the rope. This means that the inner tension has been eliminated. The wires and strands have no tendency to "fight themselves" or each other.

You can prove this simply by cutting a section of Form-Set, leaving it unseized. Each and every wire lies just as it was. No bushing—no flying apart—for the wires and strands are *relaxed*.

What does this mean? For one thing, easier handling. More important, though, is the longer life that often results when the rope is subjected to sharp turns and bends—reverse bends, for instance.

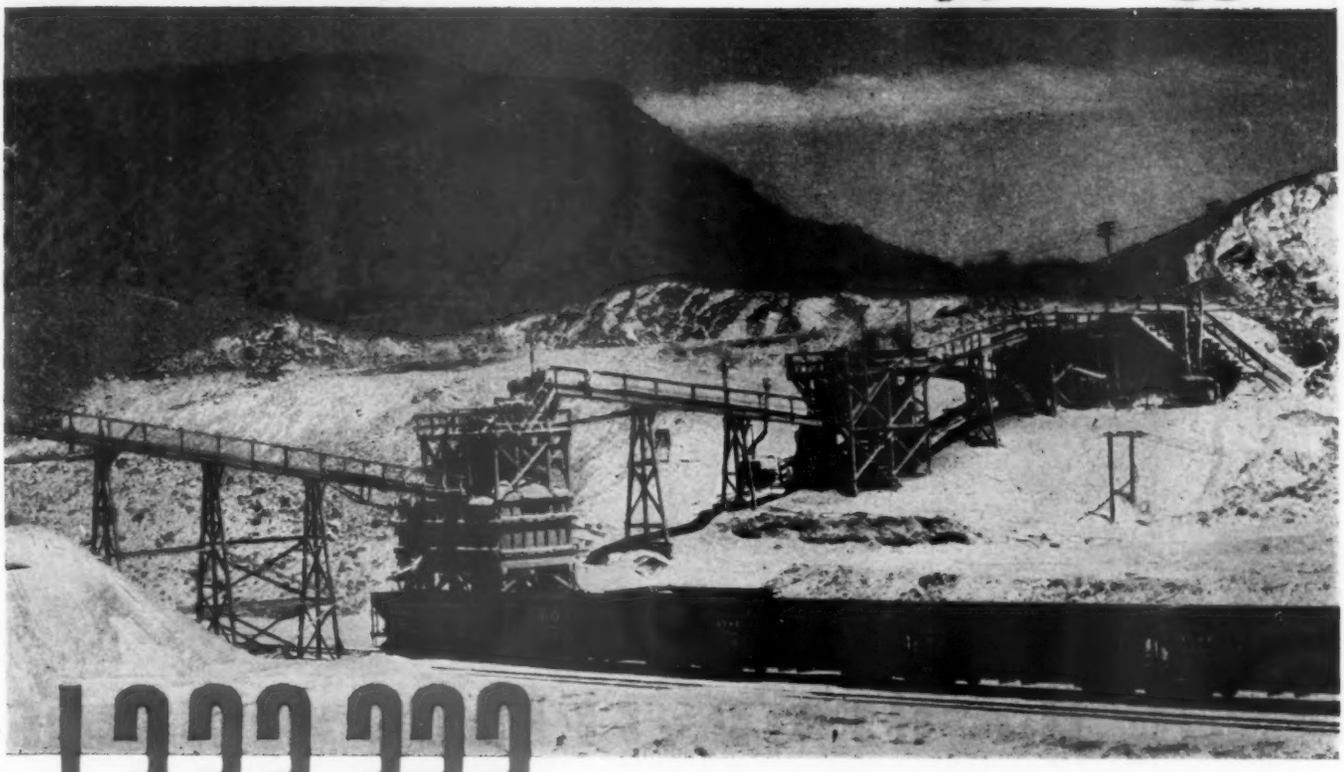
All grades, sizes, and types of Bethlehem wire rope can be obtained with the Form-Set construction. Ask the nearest Bethlehem office or distributor to tell you more about it.



Here is a piece of "relaxed" wire rope. Even when cut or broken, the Form-Set wires and strands lie calmly in place. No tension at all—yet the toughness remains.

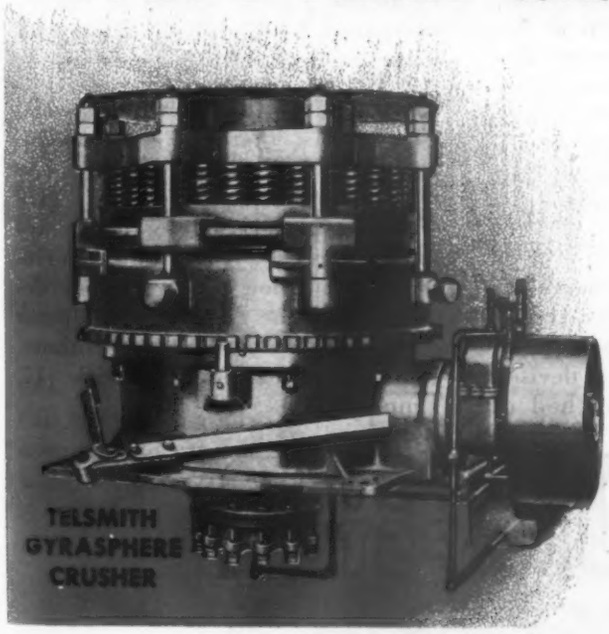
When you think WIRE ROPE . . . think BETHLEHEM

. . FOR THE ATCHISON TOPEKA AND SANTA FE



1,333,333 CUBIC YARDS OF BALLAST

. . IN 5 YEARS with TELSMITH



They use a lot of ballast on the A.T.S.F. Ry. Much of it is supplied by the Sharpe & Fellows Contracting Co. of Los Angeles, California. This is one of their quarries—at Sais, New Mexico, southeast of Albuquerque. Here a 48″ Telsmith Gyrasphere Secondary Crusher, powered by a D-17000 Diesel engine, has crushed 1⅓ million cu. yds. of hard rock down to ballast size, in the past five years. Their crushing plant is also equipped with two 5′x 12′ Telsmith Double Deck Pulsator Screens.

If you want a secondary crusher that works at choke feed . . . crushes finer . . . that turns out *enormous* tonnage . . . all of it remarkably uniform . . . and does it with lowest upkeep, get a Telsmith Gyrasphere. Telsmith Pulsators assure efficient, low-cost screening. Send for Telsmith Complete Plant Bulletin Q-15. Q-15

SMITH ENGINEERING WORKS, 504 E. CAPITOL DRIVE, MILWAUKEE 12, WISCONSIN

Cable Addresses: Sengworks, Milwaukee—Concrete, London

51 East 42nd St. New York 17, N.Y. | 211 W. Wacker Drive Chicago 6, Ill. | 713 Commercial Trust Bldg. Philadelphia 2, Pa. | 247 Third Street Cambridge 42, Mass. | Boehck Eqpt. Co. Milwaukee 3, Wis. | Mines Eng. & Eqpt. Co. San Francisco 4—Los Angeles 14

Brandeis M. & S. Co. Louisville 8, Ky. | Rish Equipment Co. Charleston 22, & Clarksburg, W. Va. | Rish Equipment Co. Roanoke 7, & Richmond 10, Va. | North Carolina Eqpt. Co. Raleigh and Charlotte 1, N.C. | Wilson-Weesner-Wilkinson Co. Knoxville 8, & Nashville 6, Tenn.

YOU CAN MAKE 1946 A MORE PROFITABLE YEAR—

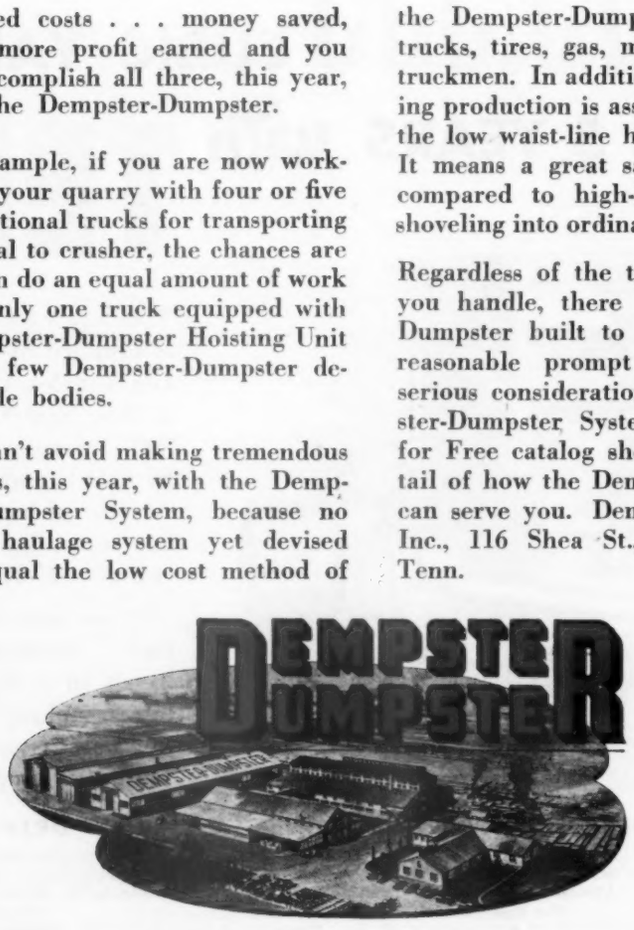
—with the DEMPSTER-DUMPSTER

Reduced costs . . . money saved, mean more profit earned and you can accomplish all three, this year, with the Dempster-Dumpster.

For example, if you are now working in your quarry with four or five conventional trucks for transporting material to crusher, the chances are you can do an equal amount of work with only one truck equipped with a Dempster-Dumpster Hoisting Unit and a few Dempster-Dumpster detachable bodies.

You can't avoid making tremendous savings, this year, with the Dempster-Dumpster System, because no other haulage system yet devised can equal the low cost method of the Dempster-Dumpster for saving trucks, tires, gas, maintenance and truckmen. In addition, greater loading production is assured because of the low waist-line height of bodies. It means a great saving in energy compared to high-level lifting of shoveling into ordinary truck bodies.

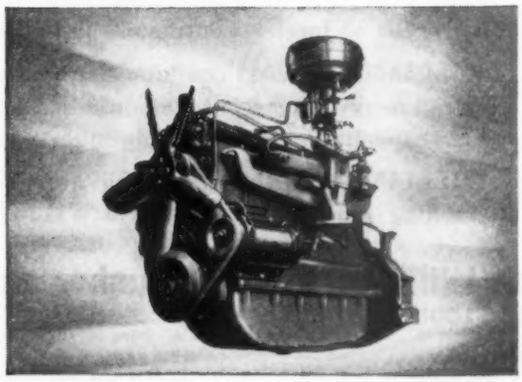
Regardless of the type of material you handle, there is a Dempster-Dumpster built to handle it. For reasonable prompt delivery, give serious consideration to the Dempster-Dumpster System now. Write for Free catalog showing every detail of how the Dempster-Dumpster can serve you. Dempster Brothers, Inc., 116 Shea St., Knoxville 17, Tenn.



Ask G.I. Joe about GMC Pulling Power

On every battle front G.I. Joe saw proof of GMC's pulling power. In the South Pacific, in temperatures as high as 130 degrees, GMC "six-by-sixes" hauled huge loads through hub-deep mud and sand. In Europe, GMCs played the leading role on the famous Red Ball Express. In Alaska's ice and snow, Burma's jungles and Italy's mountain trails... wherever heavy loads were pulled through heavy going... GMCs did the job.

G.I. Joe knows about GMC pulling power... and what he can tell you is mightily important to truck buyers. For GMC commercial models, ½ to 20 tons, have engines of the same basic design as their military brothers. They offer the civilian counterpart of the power, performance and stamina demonstrated by nearly 600,000 GMC "Army Workhorses."



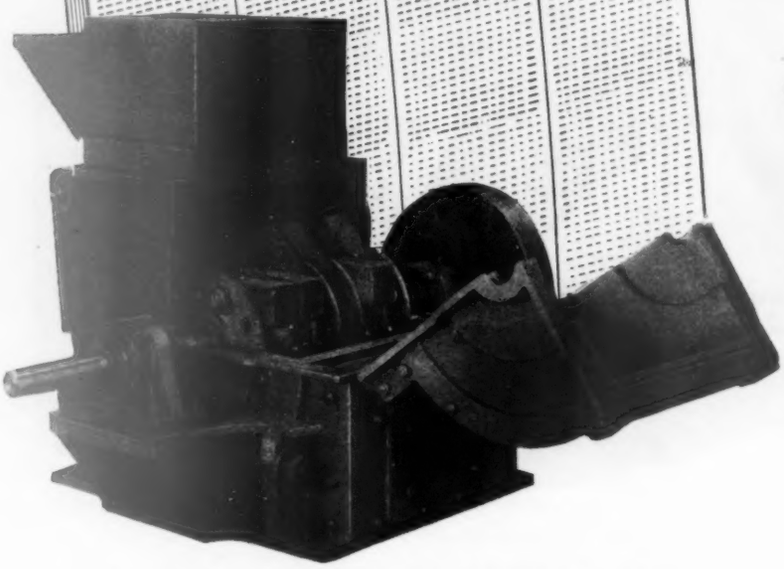
The famous "270" engine, power plant of the "Army's Workhorse," also powers GMC models in the 3-ton range. All other GMC gasoline engines are of the same basic, war-proved design.

THE TRUCK OF VALUE — GMC TRUCKS — GASOLINE • DIESEL

GMC TRUCK & COACH DIVISION • GENERAL MOTORS CORPORATION

Farm News

BIG DEMANDS for Limestone



. . . meet 'em with

WILLIAMS Crushers

•

THEY'RE "HEADLINERS"

for large-scale production of

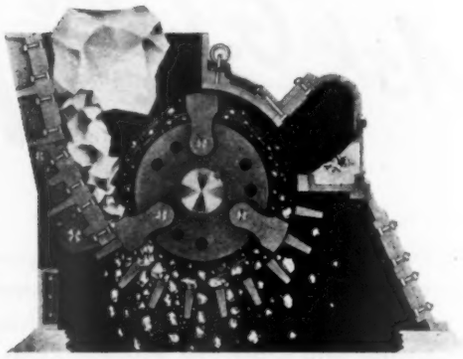
AGSTONE
CONCRETE
ROAD STONE

Open view of Williams "Slugger" Crusher showing heavy duty hammers, liners and discs. The "Slugger" reduces ONE MAN size stone to 1¼", ¾" or agstone in ONE OPERATION.

WILLIAMS Hammermills are "Good News" for crushed stone producers who must keep pace with the expanding needs of farmer, contractor, and road builder.

WILLIAMS Crushers combine simplicity in design with extra heavy-duty construction, insuring continuous, high-capacity service and minimum operating costs.

WILLIAMS furnishes a size for every job—and every crushing job does *better* with a WILLIAMS!



Sectional view showing operation of the Williams Hammer Principle of crushing.

Write for Bulletin 619

The Williams Patent Crusher and Pulverizer Co.

802 ST. LOUIS AVE. ST. LOUIS 6, MO.

Sales Agencies in All Principal Cities Including

CHICAGO 5
37 W. Van Buren

NEW YORK 7
15 Park Row

PHILADELPHIA 6, PA.
11 N. Fourth St.

WILLIAMS PATENT CRUSHER & PULVERIZER CO. ST. LOUIS THE TRADE MARK REG. U.S. PAT. OFF.

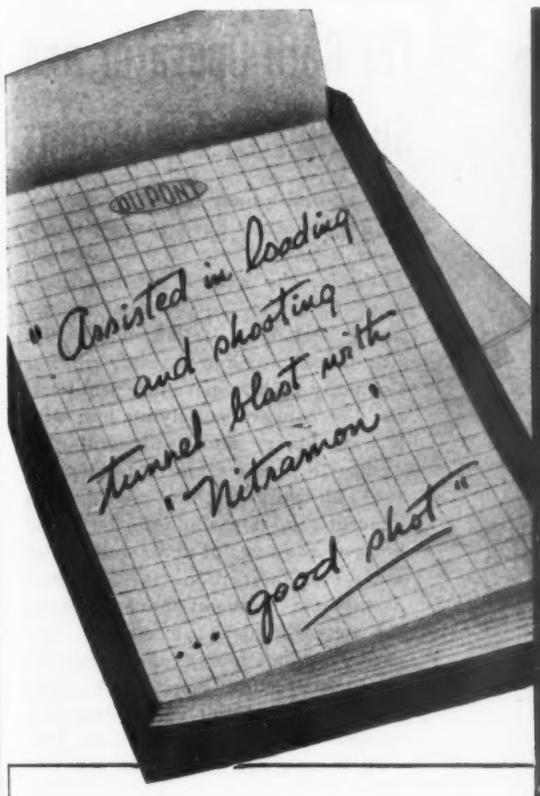
Williams

OLDEST AND LARGEST BUILDERS OF HAMMERMILLS IN THE WORLD

WILLIAMS

PATENT CRUSHERS GRINDERS SHREDDERS

(Notes from a Du Pont Technical Service Man's Field Book)



Tunnel Blasting Problems Are Simplified With This Safest Blasting Agent* and the Help of Du Pont Technical Men

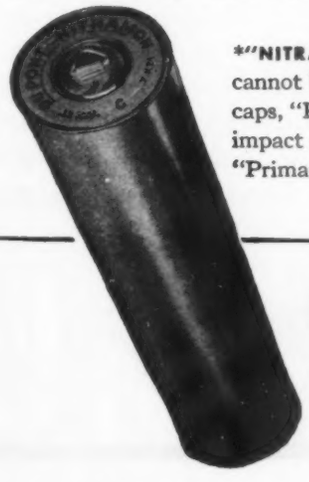
An eastern Pennsylvania trap rock company planned a tunnel blast with "Nitramon." The operator was faced with these problems:

1. **Location of the adit.**
2. **Distance adit and wings should be driven.**
3. **Setting up and checking of reference points.**
4. **Estimating the quantity of "Nitramon" required for the tonnage desired.**
5. **Advice in loading the charge. Method and amount of stemming.**

Solutions to these and other questions were arrived at by Du Pont Technical Service Men working with the quarry operators. Technical Service Men also supervised the loading of "Nitramon" and offered other recommendations that helped make the shot a success.

Extremely hot weather during loading operations prompted the workmen to express appreciation for freedom from headaches due to use of "Nitramon". . . an important characteristic of this safer blasting agent.

If *your* quarry operation presents a blasting problem, turn to "Nitramon" and call on a Du Pont Technical Service Man. Both will help you do the job efficiently and economically. E. I. du Pont de Nemours & Co. (Inc.), Explosives Dept., Wilmington 98, Delaware.



***"NITRAMON"—THE SAFEST BLASTING AGENT.** "Nitramon" cannot be detonated by the strongest of commercial blasting caps, "Primacord," open flame, friction, falling objects or the impact of a rifle bullet. It is detonated with a combination of "Primacord" and "Nitramon" Primer.

DU PONT
REG. U. S. PAT. OFF.
BETTER THINGS FOR BETTER LIVING
...THROUGH CHEMISTRY

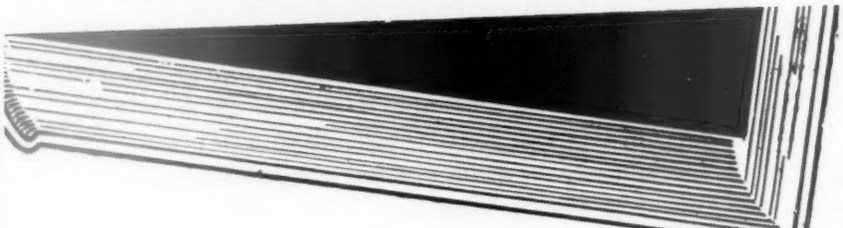
DU PONT "NITRAMON"

A Product of Du Pont Explosives Research

An Indispensable Too For Both Operator and Supplier of Equipment

The pit-and-quarry industries, in providing important basic raw materials, bear a large share of the responsibility for the success of America's war effort. For the producer the revised Technical Section of the 1945 Handbook provides a ready answer for many of his operating problems. For the concern supplying him with the machinery and equipment necessary to produce his materials, the 1946 Directory Section provides an accurate, up-to-the-minute list of all known producers of nonmetallic minerals and their products. No effort or expense has been spared to make the new Directory an efficient and highly useful source of information about producers. Because of conditions brought about by the war, the number of changes made in the 1946 edition runs into the thousands.

1946 Edition Now on the Press



Directory Section listings appear two ways — (1) alphabetical by companies, (2) geographical by plants. You get company names, officers, location of plants, their capacity, and the names of the men who do the buying.

- 810 PAGES
- 25 CHAPTERS
- AUTHORITATIVE
- 15,000-NAME DIRECTORY
- COMPLETELY INDEXED

Order NOW and get one of the first copies off the presses. Use the handy coupon below.

Pit and Quarry Publications
538 South Clark Street, Chicago 5, Illinois

Date .....

Please send me

—copies of the 1946 Handbook and Directory bound together at $15.00

—copies of the 1946 Directory bound separately at $15.00

☐ Check is enclosed

☐ Mail me the bill

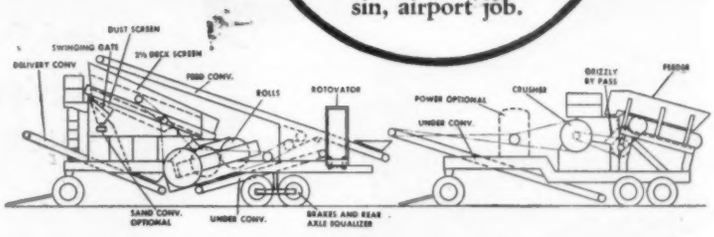
Name ..... Title .....

Company .....

City ..... State .....

822-Q = { PORTABILITY + HIGH PRODUCTION

One of two Universal 822-Q plants owned by Art Overgaard, a highly successful Wisconsin crushed rock and aglime producer, whose operations have been widely publicized. Plant is shown on the La Crosse, Wisconsin, airport job.



PRIMARY UNIT SECONDARY UNIT

Typical of the many profit-proved Universal portable crushing plants, is the 822-Q crushing, screening and loading plant. Primary reduction is by a Universal 546-P Unit which consists of rugged, steel plate hopper with built-in apron feeder, bar grizzly and by-pass, jaw crusher and underconveyor. Maximum capacity and minimum jaw wear is assured, as material not requiring crushing is short circuited.

Screening and secondary reduction is by the Universal 800 Secondary Unit. Material is fed to the 2½ deck gyrating screen, where larger oversize is scalped direct to rolls from top deck, protecting lower decks from excessive wear and assuring maximum screening efficiency. Material retained on lower deck also goes to rolls—throughs, to mixing hopper and delivery conveyor—dust is rejected by ½ deck. Material from roll crusher is returned to screen via Rotovator, closing circuit. A double deck auxiliary gyrating screen may be set in oversize Rotovator for production of 100% chips for seal coating, if desired.

The Universal 822-Q Crushing and Screening Plant combines the high production of dual crusher units with extreme flexibility, in a compact, easy-to-move plant. Either unit can be used independently. The 800 Secondary Unit is adapted to use as a gravel plant.

This is part of the story—read the rest in Bulletin 30.

UNIVERSAL ENGINEERING CORP.
619 C Ave. W. Cedar Rapids, Iowa

UNIVERSAL

ROCK AND GRAVEL CRUSHERS, CRUSHING ROLLS, HAMMER MILLS, COMPLETE CRUSHING AND SCREENING PLANTS, WASHING PLANTS, ASPHALT PLANTS, SPREADERollers.

"ALWAYS ON THE TARGET"

SINCE McLANAHAN 1835

PRODUCTS

IF you are shooting for higher production and profit records, *you can't miss* when you use McLANAHAN Equipment.

Modern industrial operations require machines that are consistent high scorers in reliability, capacity and economy . . . with time-proved performance standards that typify McLANAHAN Equipment.

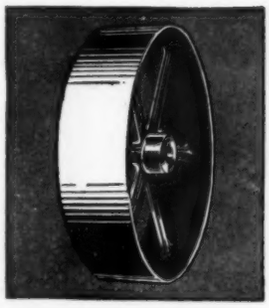
McLANAHAN Machines are in world-wide service

Write for the McLanahan Facts!

McLANAHAN & STONE CORP. HOLLIDAYSBURG, PENNSYLVANIA

Now is the Time...

TO GET THE MOST OUT OF MANPOWER AND MACHINES



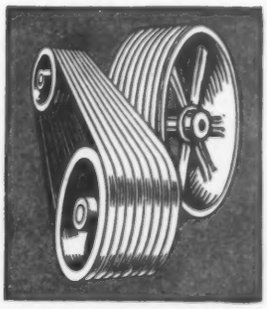
In this, the dawn of a new era in industrial expansion, the trend is toward lower-cost production.

The highest returns must be derived from investments in manpower and machinery. Trouble-free, efficient and *economical* operation is possible only with well engineered transmission equipment.

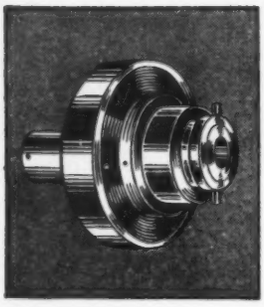
With more than 88 years' experience in the manufacture of a variety of items for mechanical transmission of power, Wood's are equipped to furnish American industry with a complete line of products engineered to transmit power with the utmost efficiency.

PULLEYS . . . for every need. Standard flat belt pulleys, solid or split, single or double arm; flanged if required. Loose pulleys, bronze bushed or ball bearing equipped. Motor pulleys, taper or step cone types and special designs to the customer's specifications.

BEARINGS . . . solid and split journal bearings; grease lubricated and ring oiling pillow blocks, post and hanger bearings. Angle pillow blocks and vertical shaft types available.



SHEAVES . . . for many years suppliers of cast iron sheaves for rope drives, Wood's were among the first to manufacture the new type sheave. Today the line comprises a full list of cast iron and cast semi-steel standard type sheaves for all industrial V-belts; also Sure-Grip V-belts and complete drives.



SEE *Wood's* . . . for everything for group drive; clutches, compression and flexible couplings and hangers for every purpose.

Engineering consultation available

EVERYTHING IN TRANSMISSION

Pulleys • Clutches • Hangers • Pillow Blocks
Couplings • Bearings • V-Belt Sheaves
and Complete Drives

T. B. WOOD'S SONS COMPANY, CHAMBERSBURG, PENNA.

Branches: Boston, Mass. Newark, N. J. Pittsburgh, Pa. Cleveland, Ohio Detroit, Mich. Houston, Texas

Osgood PROVED IN SERVICE

9-Year-Old Osgood Shovel Brings Top Price in Surplus Equipment Sale

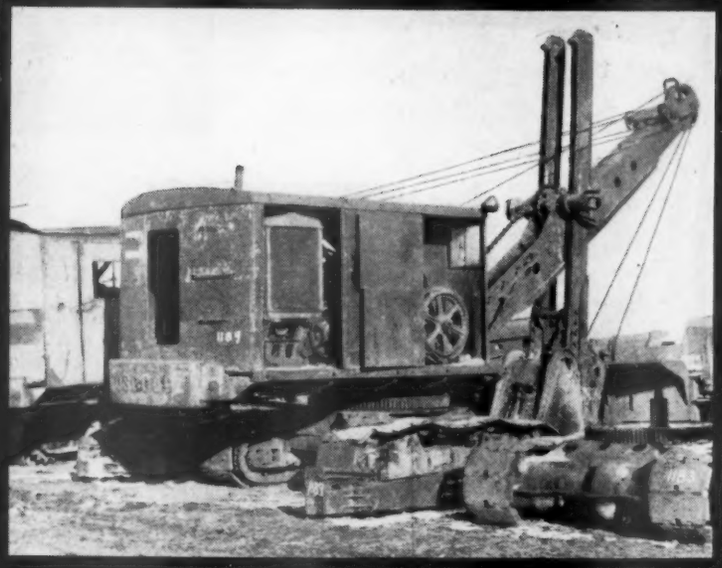
Even after it had gone through nine years of grueling service, this Osgood shovel looked good to the experienced construction machinery dealers who were bidding on it. Every one of the bidders was banking on the stamina built into every Osgood machine . . . they knew that there still were years of service left in this veteran.

That's what engineered design and precision manufacture means — long-lived, dependable, trouble-free service. It's an important fact to keep in mind when you're selecting your new equipment for postwar projects. We'll be glad to send complete information on the complete line of Osgood construction, excavating and materials handling equipment . . . to tell you how and why Osgoods will stay on the job, day after day, turning in better performance records at lower cost.

THE RECORD

Manufactured in 1936, this 1½ yard Osgood shovel had already turned in nine years of faithful service when it was offered at a recent surplus equipment sale. The bidders, experienced construction and excavating machinery dealers, knew the machine had been in service on the Alcan highway project for nearly two years; working under the most adverse conditions, with only sketchy provisions for maintenance. This Osgood, nine years old and offered "as is," brought the highest price of any of the 1189 pieces of equipment in the sale!

THE MACHINE



THE GENERAL EXCAVATOR COMPANY
CRANES, DRAGLINES AND SHOVELS
DIESEL, GAS, ELECTRIC

Associated with The General Excavator Company

OSGOOD — CRANES-SHOVELS — MARION OHIO USA — OSGOOD GENERAL

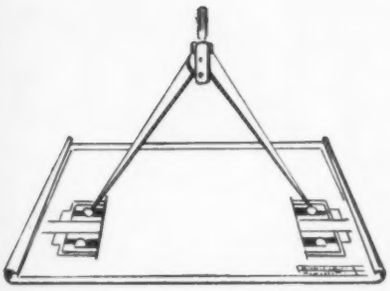
THE OSGOOD COMPANY • MARION, OHIO

ARMY E NAVY

OSGOOD
SHOVELS, DRAGLINES
CRANES

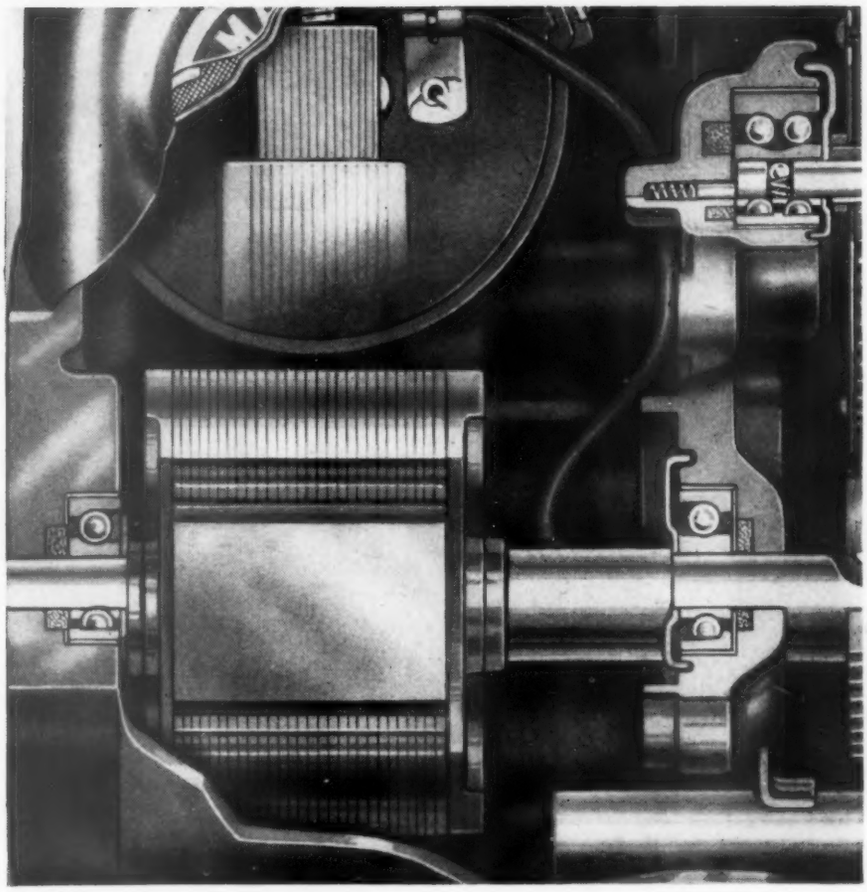
GOOD MAGNETOS

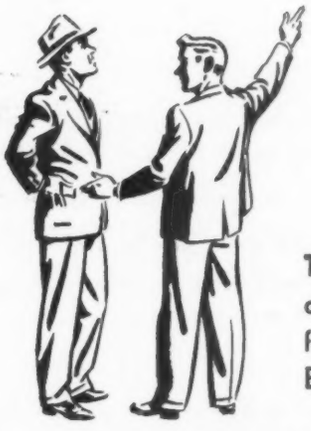
have Correctly-spaced Bearings

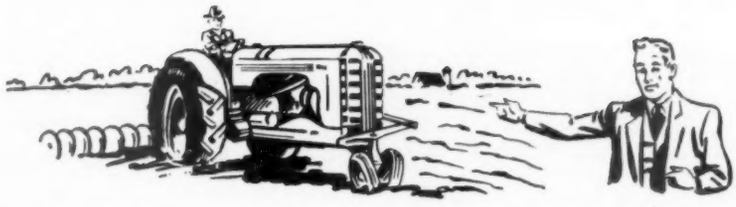


CORRECT SPACING IS VITAL. It is vital that spacing between rotor and rotor tunnel be maintained to hair-line accuracy. This can be done only by correctly-spaced bearings, maintaining proper alignment of the rotor under all operating conditions.

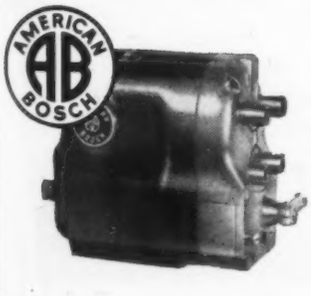
AMERICAN BOSCH MAGNETOS have correctly-spaced bearings for longer life and smoother, more-dependable performance.







THEY CAN TAKE IT. They stand up under the most gruelling conditions because they are balanced for smooth, vibration-free performance. You'll find many such hidden values behind the American Bosch trademark on all types of automotive electrical equipment.



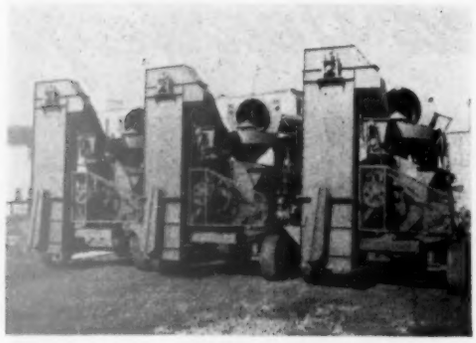
AMERICAN BOSCH CORPORATION, SPRINGFIELD 7, MASS.

AMERICAN BOSCH

Super-Powered Magnetos

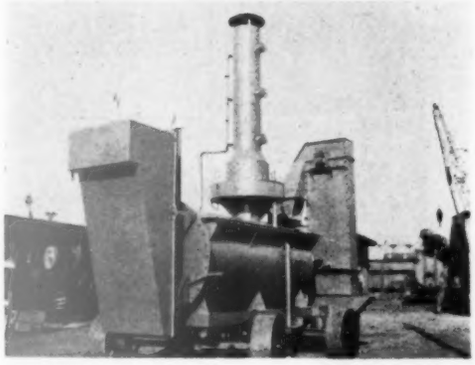
Portable

DECONTAMINATION MACHINES



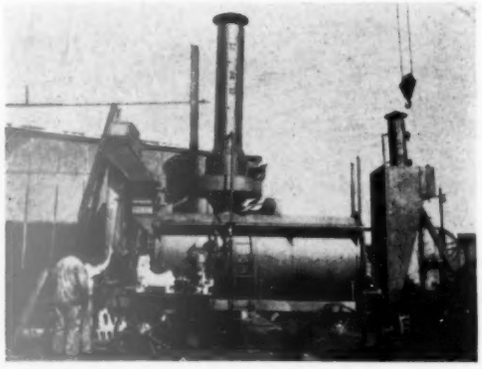
made by

LIME & HYDRATE PLANTS CO.

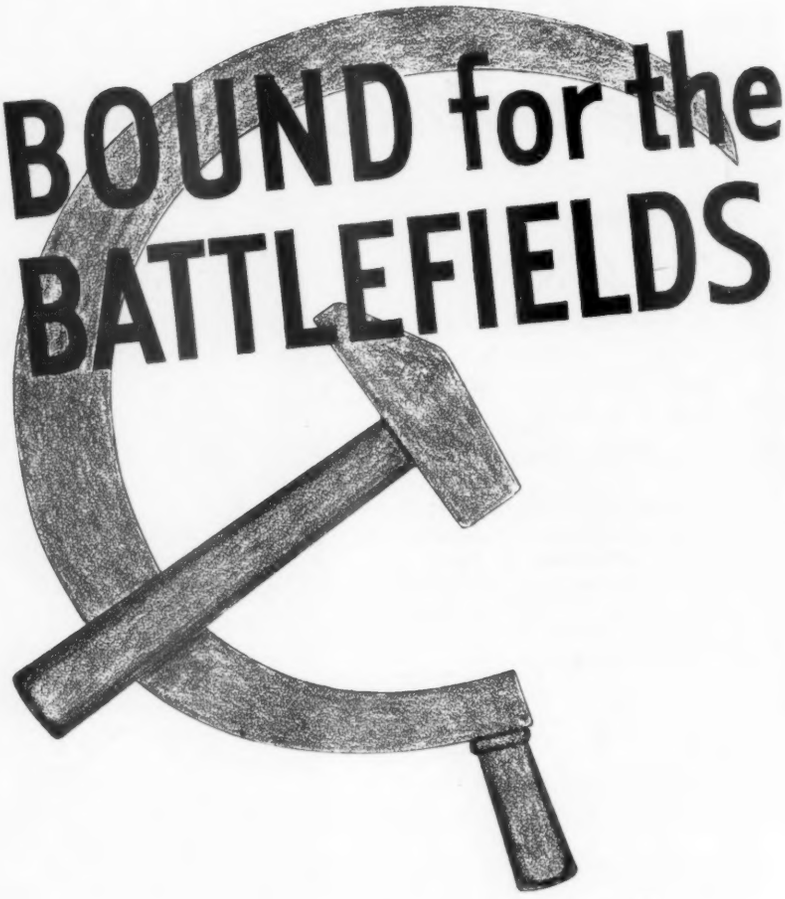


. . unique

no other machines like them



BOUND for the BATTLEFIELDS



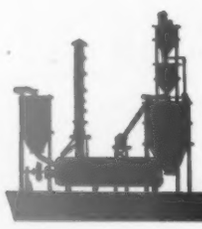
A necessary aftermath of the tragedy of war is the decontamination of former battle zones.

For this purpose, the Russian Government has recently purchased from LIME & HYDRATE PLANTS COMPANY three combination portable hydrate and milk of lime machines for providing a liquid deodorizing material.

These machines are "something new" in the lime field — completely portable, self-contained units that can be shifted at need, and supplied with water from any source.

In addition to their primary job, these versatile LIME & HYDRATE decontaminators will be used for building operations, orchard spraying, and manufacturing milk of lime for sugar.

WRITE FOR BULLETINS



OTHER PRODUCTS — LIME PLANTS COMPLETE - HYDRATORS - SHAFT KILNS
ROTARY KILNS - DRYING MACHINERY - TANKS - BINS - GREY IRON CASTINGS
SUGAR MACHINERY - SPECIAL MACHINERY FROM ENGINEER'S DESIGNS

LIME & HYDRATE PLANTS CO.

York, Pennsylvania

Sooner than you think

You'll be asked to supply materials for the greatest construction boom America has ever seen. That leaves only a little while before Spring to streamline and modernize your plant so that you will be in a position to supply the heavy demands that will be made on your productive capacity . . . and to supply those demands at a profit.

This is the time to investigate Robins Job-Engineered materials handling machinery. With a Job-Engineer to offer suggestions, you'll be able to lower operating costs . . . reach a higher rate of production . . . and enjoy increased efficiency in the bulk handling of aggregates.

For half a century, Robins Job-Engineering has been recognized as *the* outstanding service in all phases of design and manufacture for bulk materials handling machinery. And 41 Robins-pioneered "firsts" are evidence of the advantages you can gain from Job-Engineering.

Profit from this example by writing or calling Robins soon. A fully qualified Job-Engineer will come to your desk to help you prepare for Spring.

AMERICA'S ONLY *COMPLETE* MATERIALS HANDLING SERVICE

Hewitt and Robins unite to offer you 136 years of combined experience in Job-Engineered rubber products and machinery designed to answer every materials handling problem you may have.

ROBINS

CONVEYORS INCORPORATED

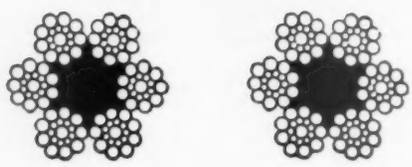
PASSAIC, NEW JERSEY

DIVISION OF HEWITT RUBBER CORPORATION

RUBIES

Two rubies, one real, the other synthetic, may look alike, yet differ in value.

and



ROPES

Two pieces of wire rope may be of identical construction yet differ in performance.

The purchaser of wire rope isn't buying wire rope, but the service that rope will render on the job. And wire rope performance is dependent not alone on its "construction" but upon the quality of the wire used in its manufacture.

Back of the long service which Wickwire Spencer Wire Rope renders is 125 years of experience. The steel is made in our own open hearth furnaces. This type of refining furnace removes all but absolute minimum quantities of harmful phosphorus and sulphur. It also permits blending of proper proportions of carbon and manganese to produce rope wire that meets exacting specifications. Only the heart of the steel ingot is used for rope wire. This is carefully rolled, drawn and processed to produce wire with the highest possible degree of hardness, strength, toughness and fatigue-resisting properties.

Every wire is drawn until it is accurate within a fraction of a thousandth of an inch . . . an important fact to remember since the performance and durability of wire rope is dependent upon accurate coordination of each component part.

Even though wire rope is tough, it is a delicate mechanism and as such is deserving of care to insure longer service. To help you get such service we have available an 82 page book packed with useful ideas for lengthening rope life. It's yours for the asking. And, if you have any problems regarding wire rope our engineers will be happy to help in their solution.

WICKWIRE SPENCER WIRE ROPE . . . IN ALL CONSTRUCTIONS FOR EVERY NEED

WICKWIRE SPENCER Steel

A DIVISION OF THE COLORADO FUEL AND IRON CORPORATION
EXECUTIVE OFFICES—500 FIFTH AVENUE, NEW YORK 18, N. Y.

Abilene (Tex.) • Boston • Buffalo • Chattanooga • Chicago • Clinton (Mass.)
Detroit • Houston • Los Angeles • Philadelphia • San Francisco • Tulsa • Worcester

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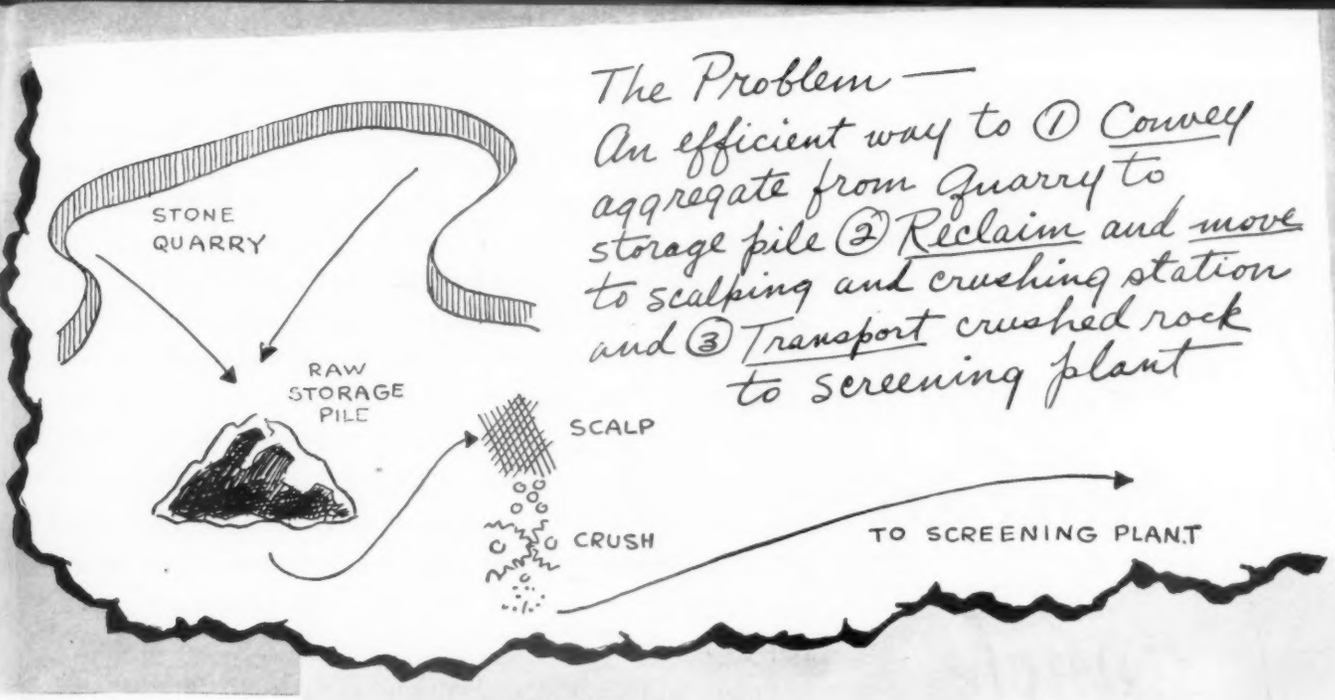
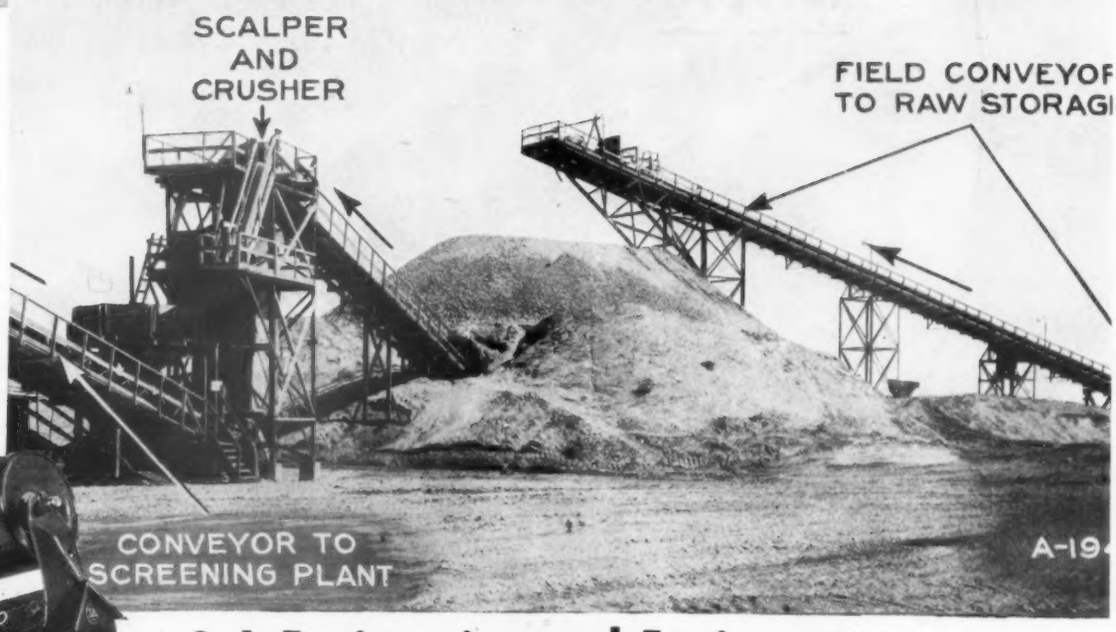


The Problem —
An efficient way to ① Convey aggregate from quarry to storage pile ② Reclaim and move to scalping and crushing station and ③ Transport crushed rock to screening plant



inclined S-A Belt Con-
r (right), which leads from
1000-foot long field con-
rs, feeds storage pile. Belt
veyor (left) reclaims from
o feed Scalping and Crush-
Station. For construction
is dam, 7,920 feet of S-A
Conveyors were used.

Pacific Type
Conveyor Carriers,
pped with Timken roller
ngs, were used on all S-A
Conveyors in this system.

S-A Engineering and Equipment Provide the *Low Cost Answer*

able S-A engineering plus dependable S-A equipment combined here to move large volumes of aggregate kly and at low cost for a large western irrigation dam. Belt Conveyors, Feeders, and a Scalping Screen were d in this part of the system.

he aggregate is moved by carryalls from the quarry to field dump hoppers, each fitted with an S-A Double iprocating Plate Feeder. These feed two 1000-foot long Belt Conveyors, which in turn discharge to an inclined Belt Conveyor which feeds the storage pile.

A reclaiming Belt Conveyor delivers the aggregate from raw storage to the Scalping and Crushing station. The aggregate, after preliminary sizing, is conveyed to the main Screening Plant by another S-A Belt Conveyor.

The cost result is further proof that S-A can help you work out a correct efficient handling system, no matter what your problem. Write us today.

STEPHEN S-A DAMSON MFG. CO.

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Designers and Manufacturers of All Types of
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They never say "*uncle*"

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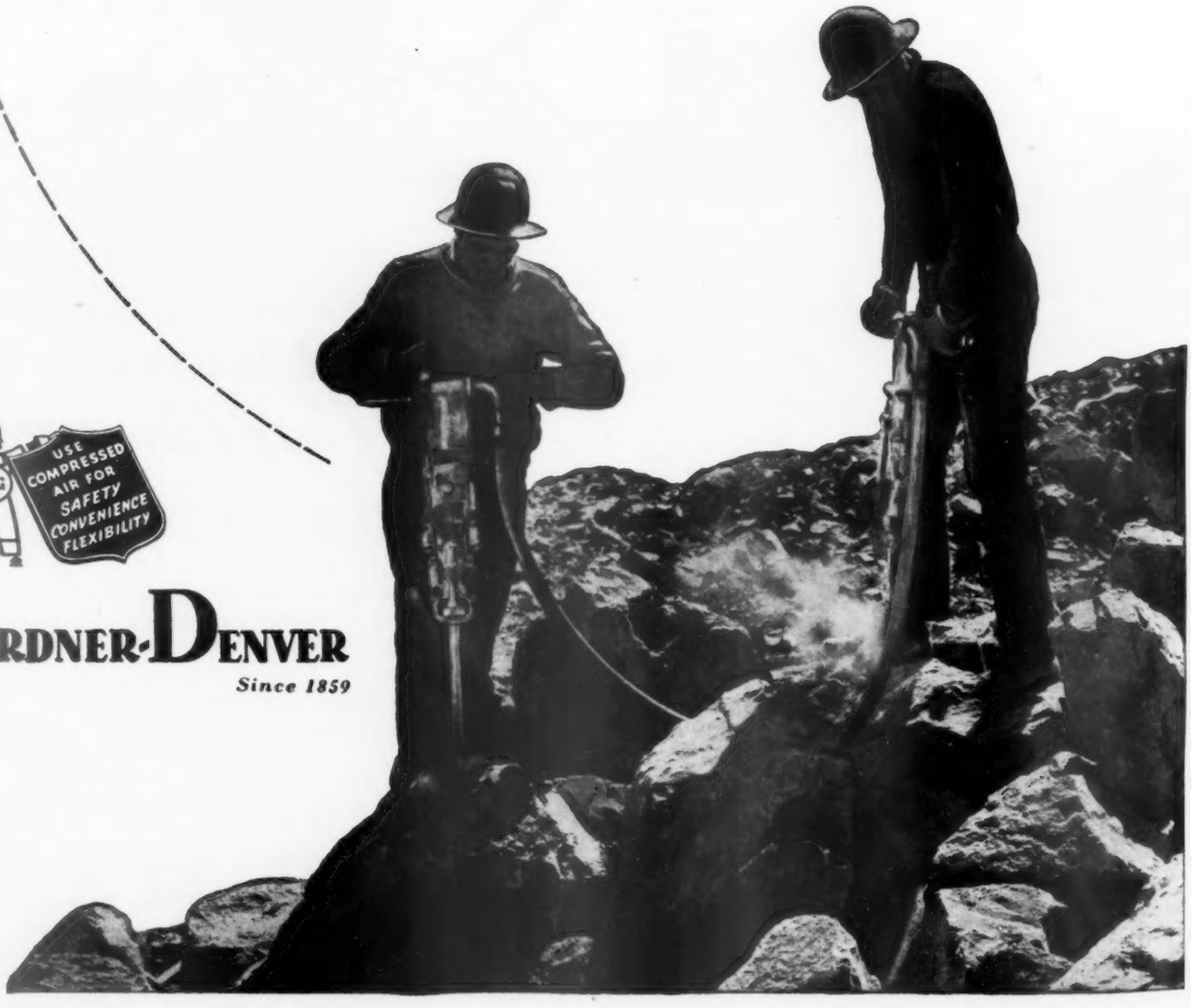
For complete information and illustrated bulletin, write Gardner-Denver Company, Quincy, Illinois.



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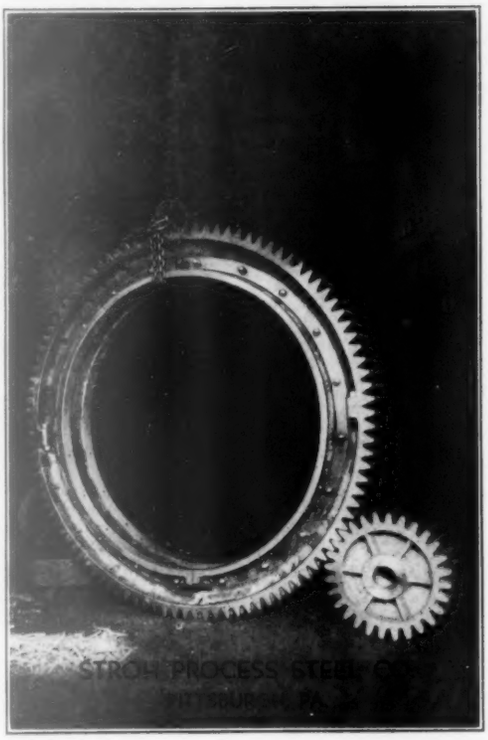

The Stroh Process is a method of casting the finest Alloy Steel together with ordinary soft steel in one solid casting done in one operation and one handling.

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HIGH COMPRESSION HYDRAULICS
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MM
MODERN MACHINERY

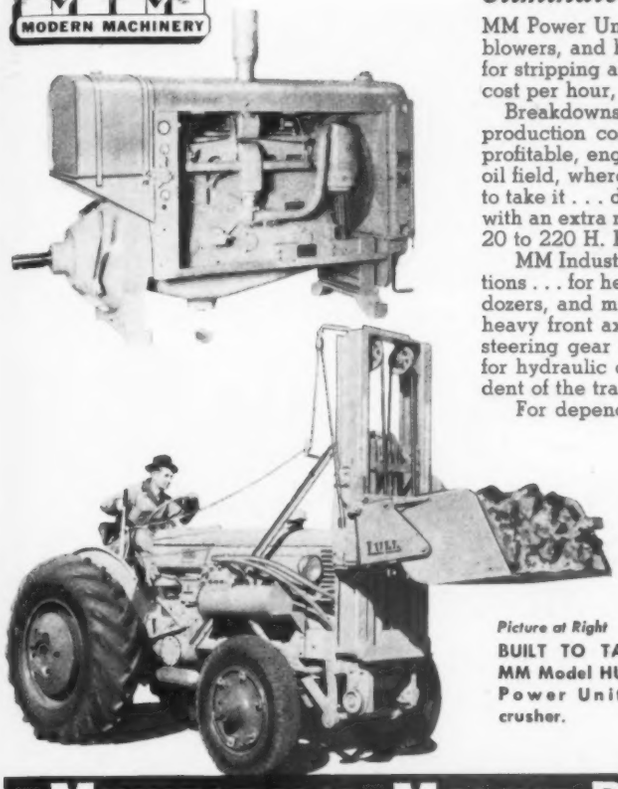
Eliminate Loss of Time . . . WITH MM INDUSTRIAL POWER

MM Power Units driving conveyers, compressors, crushers, generators, pumps, fans, blowers, and hoists, and MM Industrial Tractors equipped with bulldozers or loaders for stripping and loading provide steady, dependable performance and low operating cost per hour, per day, and per ton of material handled.

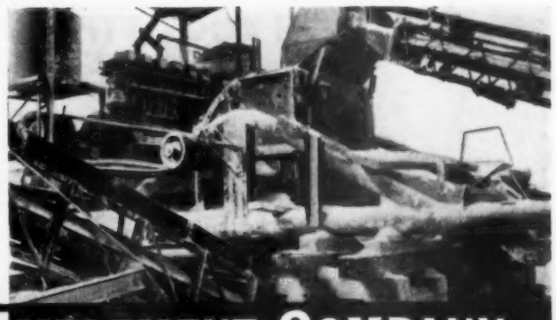
Breakdowns are mighty costly . . . meaning idle hands, reduced production, higher production costs. That's why in many fields where operation must be steady to be profitable, engineers select MM Industrial Power. MM Power Units are leaders in the oil field, where operations are 24 hours per day every day in the year. They are built to take it . . . develop maximum power with slow engine speeds, designed throughout with an extra measure of safety for long life, low cost operation. Offered in 7 sizes from 20 to 220 H. P., equipped to burn gasoline, distillate, natural gas or butane fuels.

MM Industrial Tractors have been developed for a wide variety of industrial operations . . . for heavy drawbar work as well as for use with loaders, lifts, snow plows, bulldozers, and many other mounted attachments. Offered in 3 sizes . . . featuring extra heavy front axle and tire equipment, heavy cast wheels front and rear, and special steering gear to permit easy steering under heavy loads. Front power take-off drive for hydraulic or mechanical lifts permits operation of mounted attachments independent of the tractor transmission.

For dependable heavy duty Power Units or Industrial Tractors, look to MM.



Picture at Right
BUILT TO TAKE IT . . . MM Model HUA 6-cylinder Power Unit driving a crusher.



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Elevator Buckets
All Types — All Sizes
Light and Heavy Steel Plate Construction
Hoppers — Chutes — Casings

LENGTHEN SCREEN SERVICE *with* HENDRICK PERFORATED PLATE!

Rugged Hendrick Perforated Plate is built to stand up under continuous screening operations. No time wasting work stoppage, as full clearance prevents clogging! Product uniformity is assured, as uniform mesh is maintained throughout long screen life.

Hendrick Perforated Plate is supplied in any size and shape of opening—in any specified gauge in a wide range of metals. Hendrick High Carbon, Heat Treated Steel is noted for plus performance in screening highly abrasive materials.

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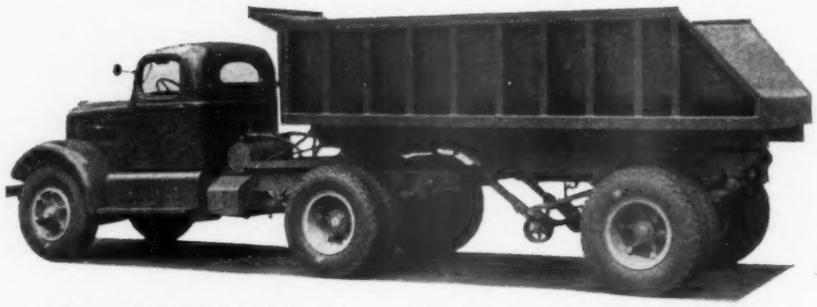

Model 5SF Semi-Trailer with 10 Cu. Yd. Rock Body

SEMI-TRAILER DUMP UNITS

WITH ROCK TYPE OPEN END OR STANDARD TAIL-GATE TYPE BODIES FOR ALL TYPES OF BULK MATERIAL HAULING NOW AVAILABLE FOR SALE WITHOUT CERTIFICATE

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NEW LEADER Truck Body Type

LIME SPREADERS

Can Now Be Purchased Without Triple AAA Certificates or Priority

THE above picture shows a rear view of the new model NEW LEADER marl and lime spreader. This spreader is equipped with an extra wide conveyor and two distributor discs and is strictly a one-man spreader. You will be able to haul wet lime or marl and, due to the large opening in the back end of the spreader, material will always feed onto the distributor disc evenly.

This spreader has many outstanding features. Both gear boxes driving the distributor discs are equipped with cut steel gears and ball-bearings running in a dust-proof and oil-tight gear case. The large gear box driving the wide chain conveyor is equipped with a steel ring gear and pinion and a thrust bearing also running in a dust-proof and oil-tight gear case. Bearing hangers are placed underneath the distributor discs; these are also equipped with ball bearings. This helps to carry the weight of the distributor discs and the load, the weight not being suspended from the gears in the small gear box. With this arrangement you are assured longer lived gears. The framework of the spreader is of hardwood.

These spreaders can now be purchased without priority or certificates of any kind. Write us for any additional information, also prices.

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Manufacturers of the World's Most Complete Line of Spreaders, Including Lime Spreaders, Sand and Cinder Spreaders, Chip Rock, Clay and Dirt Spreaders.

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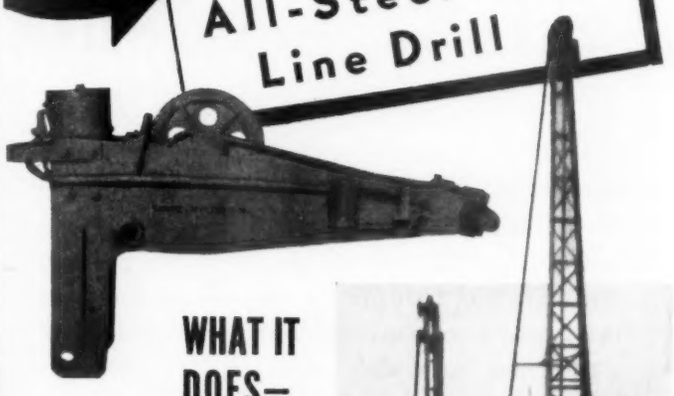
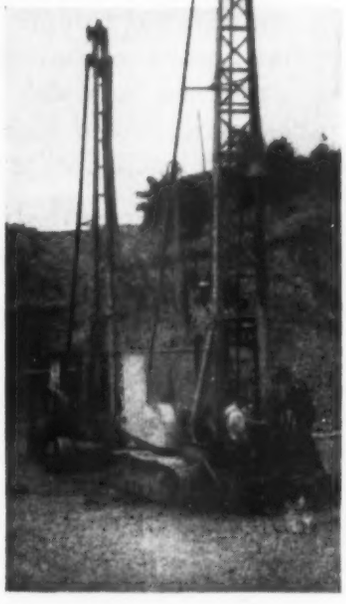
CYCLONE

NEW, Air Speed Spudder on All-Steel Wire Line Drill



WHAT IT DOES—

1. Delivers 96% of kinetic (or tool energy) to the place intended.
2. Life of steel wire line is DOUBLED.
3. Repair cost cut 50%.
4. Torsional shock and strain ELIMINATED.
5. Production INCREASED 15% to 25%.
6. Operating cost REDUCED.
7. Most holes at lowest total cost per foot.



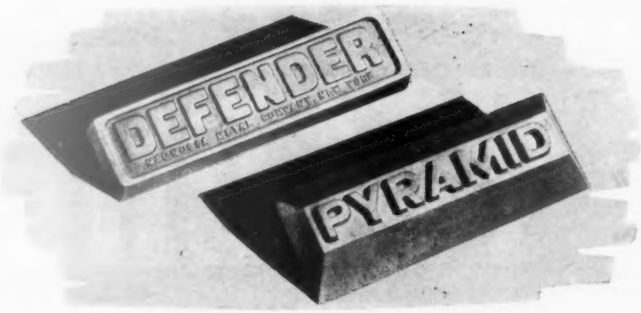
PROFIT ADVANTAGES *For You . . .*

Air speed spudder, using compressed air, injects more strength and snap to wire line drilling than is possible with the finest manila ropes. Now you can take full advantage of the resiliency of steel cable! The Cyclone way "cushions" the shock otherwise transmitted to the entire drill structure . . . and, compensates for varying tool weights. Save the Cyclone way.

New catalog B gives you profit making details and complete data on this NEW development.

THE SANDERSON CYCLONE DRILL CO.

ORRVILLE, OHIO, U. S. A.



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to the

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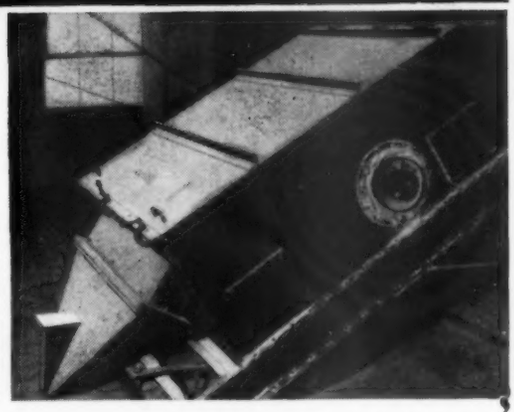

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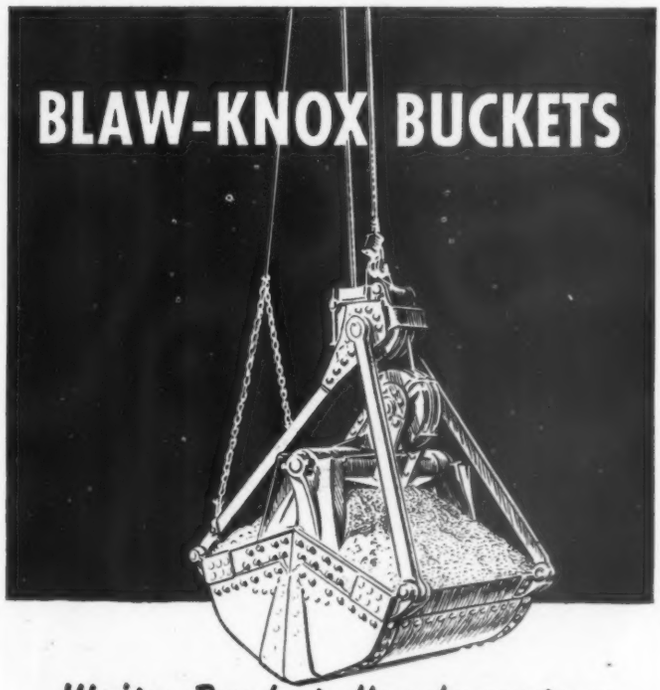

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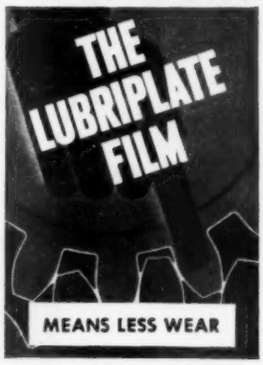

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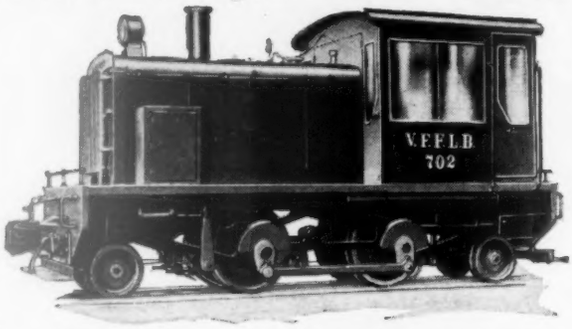

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If rail haulage is part of your operating picture, you will do well to consider entrusting your work to a Davenport Better-Built Locomotive. Built to FIT your particular conditions, a Davenport will deliver extra years of satisfying service at lowest ton-mile costs.

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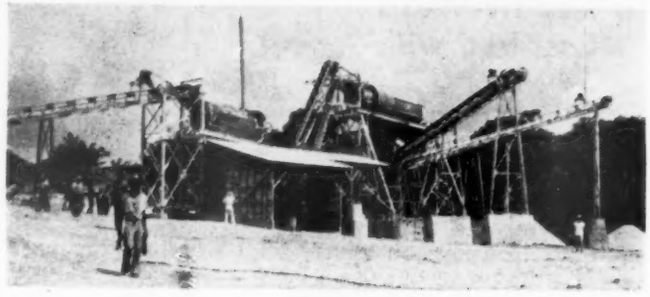
DAVENPORT LOCOMOTIVE WORKS
A DIVISION OF DAVENPORT BESLER CORPORATION, DAVENPORT, IOWA

Don't Experiment in a Quarry!



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Keep your conveyor belts going with

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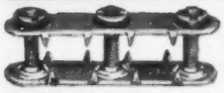
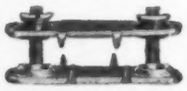
HD BELT FASTENERS



• **FLEXCO H D RIP PLATES** are used in repairing rips and patching conveyor belts. The wide space between outer bolts gives the fastener a long grip on the edges of the rip, while the center bolt prevents the fasteners from bulging.

• Avoid shutdowns and lengthen the life of your conveyor belts and bucket elevator belts by using Flexco HD belt fasteners and rip plates. Thousands of companies have stepped up the performance of conveyor lines and cut costs by using Flexco methods.



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Electricity

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ONAN ELECTRIC GENERATING PLANTS supply reliable, economical electrical service for pit and quarry applications as well as for scores of general uses.

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4475 Royalston Ave.
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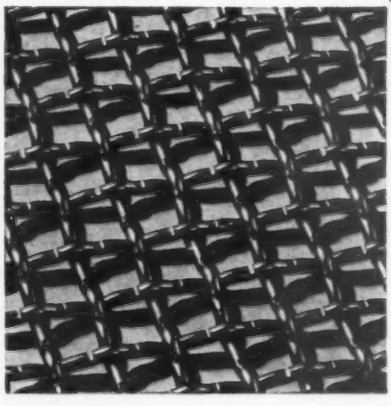
Write For Folder 690-A describing complete Onan Line



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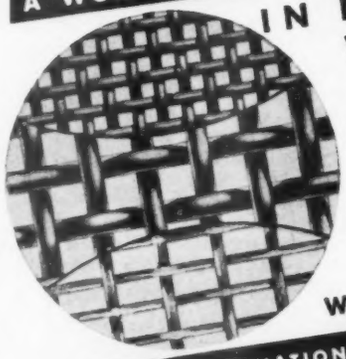

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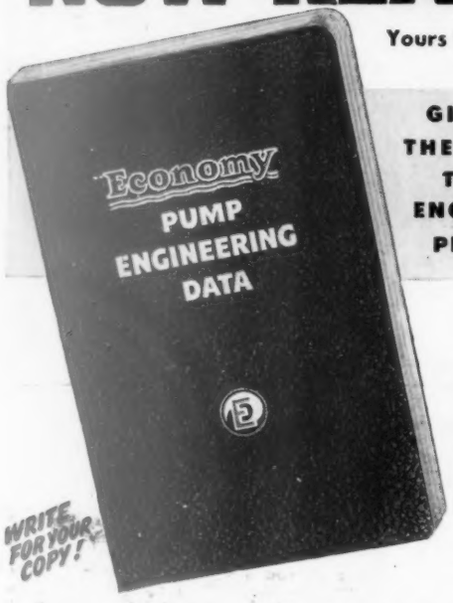

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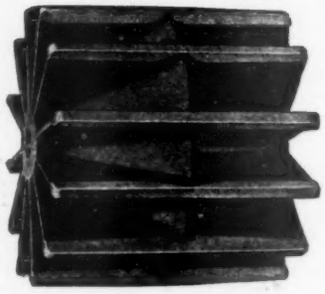

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With Base and complete controls.
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Goshen, Indiana

FOR IMMEDIATE DELIVERY OF RUBBER PRODUCTS

Conveyor Belting...Transmission Belting...Elevator Belting...Fire, Water, Air, Steam, Suction or Welding Hose, etc.

CALL, WIRE or WRITE
CARLYLE
THE RUBBER HEADQUARTERS

CARLYLE RUBBER PRODUCTS ARE NEW, GUARANTEED & LOW PRICED

CONVEYOR BELTING

ABRASIVE RESISTANT COVERS

Width	Ply	Top-Bottom	Covers	Width	Ply	Top-Bottom	Covers
48"	8	1/8"	1/16"	20"	5	1/8"	1/32"
42"	5	1/8"	1/16"	20"	4	1/8"	1/32"
36"	6	1/8"	1/16"	18"	4	1/8"	1/32"
30"	6	1/8"	1/16"	16"	4	1/8"	1/32"
30"	5	1/8"	1/16"	14"	4	1/16"	1/32"
24"	5	1/8"	1/32"	12"	4	1/16"	1/32"
24"	4	1/8"	1/32"				

Inquire For Prices - Mention Size and Lengths

TRANSMISSION BELTING

HEAVY-DUTY FRICTION SURFACE

Width	Ply	Width	Ply	Width	Ply
18"	6	10"	6	6"	5
16"	6	10"	5	5"	5
14"	6	8"	6	4"	5
12"	6	8"	5	4"	4
12"	5	6"	6	3"	4

Inquire For Prices - Mention Size and Lengths

ENDLESS "V" BELTS

"A" WIDTH All Sizes | "D" WIDTH All Sizes
"B" WIDTH All Sizes | "E" WIDTH All Sizes
"C" WIDTH All Sizes | Sold in Matched Sets

Inquire For Prices - Mention Size and Lengths

PROTECT THAT PLANT
FIRE HOSE

APPROVED SPECIFICATION HOSE
EACH LENGTH WITH COUPLINGS ATTACHED

Size	Length	Per Length
2½"	50 feet	$28.00
	25 "	16.00
2"	50 "	23.00
	25 "	13.00
1½"	50 "	20.00
	25 "	11.00

Specify Thread On Couplings

SPECIAL OFFER . . . HEAVY DUTY
RUBBER HOSE

WATER HOSE
Each Length with Couplings Attached

I.D. Size	Length	per Length
¾"	25 feet	$4.25
1"	50 "	8.00
	25 "	6.25
1¼"	50 "	12.00
	25 "	7.50
	35 "	10.50
	40 "	12.00
1½"	50 "	15.00
	25 "	10.00
	35 "	14.00
	50 "	20.00

AIR HOSE

I.D. Size	Length	per Length	Couplings
½"	25 feet	$5.00	$1.50 Pair
	50 "	10.00	1.50 "
¾"	25 "	6.25	2.50 "
	50 "	12.50	2.50 "
1"	25 "	10.00	3.50 "
	50 "	20.00	3.50 "

LARGER SIZES ALSO AVAILABLE
All Prices—Net—F.O.B. New York

CARLYLE RUBBER CO., INC.
62-66 PARK PLACE NEW YORK, N. Y.

DEPENDABLE USED MACHINES
Special—Sauerman 2 yd. slackline excavator, 150 H. P. electric

2 yd. Koppel cars, 36"
20x30 portable conveyor
Byers Model 83 crane*
40x22 roll crusher
10x20 portable crusher
15x36 roller bearing crusher
Bay City Model 25 dragline*
Osgood Model 605 dragline*
Byers ¾ yd. dragline
Bay City Model 65 dragline*
Pioneer Duplex gravel plant
Day No. 5 hammermill
Jaeger 4x6 pump
Speeder ½ yd. shovel
25 ton low bed trailer

NOTE: Items followed by asterisk (*) are for rent only.

TRACTOR & EQUIPMENT COMPANY
3506 W. 51st St. Chicago 32, Ill.

GASOLINE & DIESEL ENGINES

From 1½ HP to 100 HP available from stock.

JOHN REINER & COMPANY
12-12 37th Avenue Long Island City, N. Y.

FOR SALE

1—3 ton per hour Kuntz Hydrator
1—5 ton per hour Kuntz Hydrator
Each replaced for larger sizes. These are rebuilt and 100% efficient—90% new.
1—3 ton per hour Clyde Batch Hydrator
1—6 ton per hour Clyde Continuous Hydrator
We have a number of lime feeders and a number of hydrate feeders.
1—2½ yard size dump car 30" gauge track. Track gauge can be made to suit.
1—Portable Ingersoll Rand Air Compressor—315 cu. ft. per minute. Waukesha engine. First class condition—ready for use.
One 27S Ransome Mixer on rubber tires—Good condition.
One 212 Gallon Road Grader 12' Blade—Excellent condition.

Lime & Hydrate Plants Co.
50 S. Beaver Street, York, Pennsylvania

Jaw Crushers—4"x8" up to 18"x36".
Crushing Rolls—16"x10" up to 54"x24".
Gyratory Crushers—No. 3, No. 12.
Ring Roll Mills—No. 0, No. 1, and No. 2.
Swing Hammer Mills.
Rotary Fine Crushers—Nos. 0, 1, 1½ and 2.
Direct Heat Rotary Dryers—3½'x25', 4'x30', 5½'x40', 6'x50', 7'x50'.
Semi-indirect heat Dryers—70"x35', 60"x30'.
Cement Kilns—3' up to 11' diameter.
Hardinge, Marcy & Fuller-Lehigh Mills.
Raymond Mills—Nos. 00, 0, 1, 4 & 5 Roll.
Tube—Rod and Ball Mills—3' to 6' diameter.
Vibrating Screens—Air Separators.
Lime hydrating plant.
New Dryers built for all purposes.

W. P. HEINEKEN
227 Fulton St., N. Y. Tel. Barclay 7-7298

FOR SALE

Lorain 75A—shovel attachment
Northwest 6—shovel attachment
Lorain 30—½ yd. crane with digging clamshell bucket
P & H 450—⅞ yd. comb. shovel-dragline
Northwest 6—1½ yd. comb. shovel-dragline
Lima 603—1½ yd. comb. shovel-dragline
Marion Electric—6 yd. shovel with 80' boom Caterpillar Tractor D6 with bulldozer
Eagle Log Washer—sand and gravel—40 yds. per hour.
Diamond Model 36 Gravel Crushing and Screening Plant in fine condition—complete with extra parts.

•

THE CHAS. M. INGERSOLL COMPANY
19930 Detroit Road, Rocky River 16, Ohio

24x50" Champion, 28x36" Webb City, 14x36" Cedar Rapids and Austin No. 440 24x36" Traylor Jaw Crushers.

One TY Traylor 2'4" and 2 Austin Model 105, one No.6 fine reduction and one No. 8 Superior McCully Gyratory Crushers.

Four 4x10' Tyler Hummer Sgl. Deck Vib. Screens.

4—24"x18' Lewistown Screw Sand Washers.

Boyd "Special" 6-mold Dry Press with feeder, Model BB 4 Mold.

Barber Greene and Nelson Bucket Loaders.

• • •

Mid-Continent Equipment Company
710 Eastgate, Pa. 2290 St. Louis 5, Mo.

NEW DIESEL GENERATORS

4—200 KW 3/60/400 V. Cleveland
1—167 KW 3/50/400 V. G.M.
4—50 KW 3/60/240 V. Cummins
10—25 KW International, 3/60/230 V.
8—15 KW 3/60/220 V. Hill
5—3 KW, 110 V. Lister

NEW DIESEL ENGINES

1—150 H.P. Hercules
8—60 H.P. Chrysler

NEW GASOLINE GENERATOR UNITS

37 — 3 — 5 — 10 — 15 — 25 & 30 KW

★

R. C. STANHOPE, INC.
60 East 42nd St. New York, N. Y.

1—20-ton WHITCOMB 36" Ga. Diesel Locomotive—rebuilt.

1—32-ton Whitcomb Standard Gauge Gasoline Locomotive.

1—80-ton BALDWIN Type 0-6-0 Standard Ga. with separate tender —rebuilt.

1—20-yd. WESTERN Air Dump Car, Vertical Cylinders, reconditioned.

B. M. WEISS COMPANY
Girard Trust Company Building
Philadelphia 2, Pennsylvania

STONE CRUSHERS

15 x 24, 18 x 32, 24 x 36.

COMPLETE STONE CRUSHING PLANT

including:
24 x 36 crusher, reduction mill, gyratory crusher, bucket elevators. screens, etc.

PUMPS

4" and 6", centrifugal, gas driven. Rebuilt—very low price.

THE INDUSTRIAL EQUIPMENT CORP.
705 First Nat. Bk. Bldg., Pittsburgh 22, Pa.
Warehouse: Carnegie, Pa.

CRUSHERS - ELEVATORS
SCREENS - CONVEYORS

1—7½"x13" Champion Jaw Crusher.
2—9"x15" Champion Jaw Crusher
1—10"x20" Champion Jaw Crusher.
3—12"x26" Champion Jaw Crusher
1—12"x20" Buchanan Jaw Crusher.
1—4½" Traylor Gyratory Crusher.
1—No. 2F Telsmith Gyratory Crusher.
1—S-A-9" loop Redler Elevator.

JOHNSON & HOEHLER, INC.
Lansdowne, Penna.

FOR SALE

Sand and gravel business together with property located Central New York. Est'b. 1920. Has always operated profitably. Great future possibilities. Fully and completely equipped in every respect. Complete welding, shovel and bulldozer service. Inspection will disclose one of the finest propositions with its unlimited possibilities for very handsome returns. Priced for immediate disposal. Details appointment, wire, write.

ATLANTIC SALES COMPANY
1265 Broadway New York, N. Y.

FOR SALE

2—Cummer Dryers 54" x 30' long complete with stoker grates in A-1 condition.

2—Jeffrey Crusher rolls 24" x 18" new segments — Belt driven.

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SOFRANSCY CO., INC.
645 Mill St., Allentown, Penna.

LIQUIDATION
CHALK & ROCK GRINDING PLANT

1—Chrystie 80"x45' Rotary Dryer.
1—Oliver 8'x10' Rotary Vacuum Filter.
1—Hardinge 6'x48" Conical Mill.
1—Tube Mill, 5'x15'.
2—Rotary Screens 2'x5'.
2—Dorr 15' Bowl Classifiers.
2—Dorrco 4" Diaphragm Pumps.
1—Sturtevant 36" Rock Emery Mill.
1—Sprout-Waldron 800 lb. Dry Mixer.
1—Gruendler Hammer Mill, 24" D. x 12" F.
10—Centrifugal & Rotary Pumps.
Only Partial Listing
Send for Bulletin No. L-25

STEIN EQUIPMENT COMPANY
426 Broome St. New York 13, N. Y.

---

1 Yd. Northwest Gas Crane Model 4
⅜ Yd. Bearcat Jr. Comb. Shovel-Crane
80 Ton American Locomotive 0-6-0
Pullshovel Attach. for Lorain 77, 75A or 75B
50 H.P. Electric Hoist
1 Yd. and ½ Yd. Dump Buckets
1 Yd. Round Shaft Bucket
Shovel Attach. for 41B Bucyrus-Erie
10 Ton Buf-Spr. Roller-Gas-3 Wheel
70' boom for Northwest Model 8
1 Yd. Owen Type D Clamshell Bkt.
1 ¼ Yd. Williams Clamshell Bkt.
Shovel Attach. for Northwest Model 104

J. T. WALSH
Brisbane Bldg. Buffalo 3, N. Y.

BONDED SCALES
VIBRATING SCREENS,
CRUSHERS

15 ton, 22'x9' Truck Scale	$440.00
20 ton, 34'x10' Truck Scale	815.00
3'x6'—1-deck Vibrating Screen	495.00
3'x8'—2-deck Vibrating Screen	685.00
3'x8'—3-deck Vibrating Screen	885.00
Cinder Crusher	345.00
Coal Conveyor	745.00

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110 Bellview, Columbus 7, Ohio
Visit our factory. Inspect several models in operation. Immediate delivery.

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HOISTS

Ottumwa—10′ x 10′—450 H.P.
Ottumwa—72″ x 72″—150 H.P.
Lake Shore—10′ x 7′—400 H.P.
Lake Shore—30″ x 30″—50 H.P.
Nordberg—4′6″ x 6′6″—150 H.P.

SCREENS

5′ x 14′ Al. Chal. Sgl. Deck — Style B —Extra Heavy
6′ x 12′ Robins—Double Deck—Style C-11—Gyrex
4′ x 12′ Robins — Sgl. Deck — Style C-11—Gyrex
4′ x 12′ Robins — Dbl. Deck — Style C-11—Gyrex
4′ x 10′ Robins—Vibrex
3′ x 8′ Symons—Flat Deck—Dbl.
3′ x 6′ Symons—Dbl. Deck—Flat

CRUSHERS

4′—T.Y. Trayler Reduction Crushers —Mang. Fitted—Complete
24″ x 36″—Trayler—Type A—Jaw Crushers
13″ x 30″—Farrell — Type B—Jaw Crushers

TRANSFORMERS

500—K.V.A. 13200/6600/2200
333—K.V.A. 13200/6600/2200
150—K.V.A. 22000/2300/460
100—K.V.A. 22000/440
100—K.V.A. 22000/460/230
75—K.V.A. 22000/440/220

PUMPS—HORIZONTAL

Al. Chal. 300 G.P.M. 50 Ft. Hd.
Al. Chal. 50 G.P.M. 100 Ft. Hd.
Al. Chal. 800 G.P.M. 325 Ft. Hd.
Al. Chal. 1000 G.P.M. 170 Ft. Hd.
Al. Chal. 100 G.P.M. 200 Ft. Hd.
DeLaval—1000 G.P.M. 1250 Ft. Hd.
DeLaval—1500 G.P.M. 50 Ft. Hd.
Gardner Denver—900 G.P.M. 180 Ft. Hd.
Hydroseal—6″ x 4″
Deep Well Pumps—10 H.P.—15 H.P.—40 H.P.—100 H.P.

72″ S—DP—H—Akins Classifier — 24′ 6″ Long
10-ton Wright-Hi-Way — Low Head, Type 600, 32′ Lift, Geared Trolly Hoist, 15″ Beam
6′ x 10′—Steel Welded Ball Mill, Mang. Fitted—Complete
Gen. Electric Converters—64 K.V.A. and 55 K.V.A.
Motor Generator Sets—90 K.W.—25 K.W.
50—Sullivan & Ingersoll Rand Double Drum Tugger Hoists—15 to 50 H.P.
4—Westinghouse—4 Ton Elec. Locomotives 24″—28″—36″ Gauge — 250 Volt D.C.
5—Standard Gauge Locomotives—60 to 80 Tons
1—25′ Log Washer
1—Fairbanks Standard Gauge Track Scale—150 Ton Cap. Can be converted to truck scale.
1—48″ Ross Feeder—Complete
1—Merrick Weightometer for 36″ Belt —Complete
Gear Head Motors—
2—50 H.P. Westinghouse—116 R.P.M. Slip Ring
2—20 H.P. Westinghouse—116 R.P.M.
1— 5 H.P. Westinghouse—116 R.P.M.

★

Stanley B. Troyer
1½ East Main St., Crosby, Minnesota

FOR SALE

54″ x 24″ SUPERIOR CRUSHING ROLLS

These Rolls manufactured by Allis-Chalmers are in excellent condition, and include Countershaft, Pulleys, 3 Belts, Roll Grinding attachment, and Reciprocating Feeder. A change in the process makes these Rolls available.

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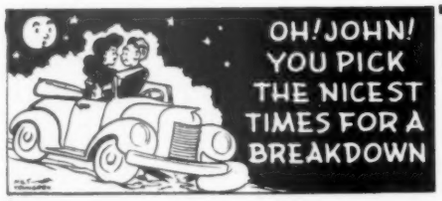
RIVERTON LIME & STONE CO., INC.
Riverton, Virginia



Cableway & Dragscraper Hoists
1—100 H.P. 2 drum Sauerman excavator, 2 speed, power 100 H.P. Lincoln mtr., 440/60/3.
1—75 H.P. 2 drum Sauerman dragscraper, 2 speed, power 75 H.P. G.E. mtr., 440/60/3.
1—50 H.P. Kern dragscraper, 2 speed, power 50 H.P. mtr., 220/60/3.

AIR COMPRESSORS
Portable and stationary, belt with elec. or gas power, sizes from 20 cu. ft. 1,000 cu. ft.

CRUSHERS
1—Acme Model No. 9 jaw crusher, with screen, elevator and gas engine. 12 to 18 tons per hr. cap.
1—Good Roads crushing plant, crusher, 10x20″.
1—No. 2 Climax jaw crusher, size 9x16″.
1—Buchanan jaw crusher, size 10x16″.
1—Acme jaw crusher, Ser. No. 1873, size 12x20″.
1—No. 3 Champion jaw crusher, size 7½x13″.
1—United Iron Works, "Blake-type" jaw crusher, size 9½x24″.
1—Sawyer Massey jaw crusher, size 9x18″.

DERRICKS
4—Steel guy derricks. 1—20 ton Insley 115′ mast, 100′ boom. 2—20 ton American steel guy derricks. 1—110′ mast, 110′ boom; 1—100′ mast, 90′ boom. 1—15 ton American steel derrick, 83′ mast, 75′ boom. 1—5 ton Terry Guy Derricks, 70′ mast, 60′ boom.
3—Stiff leg derricks.
1—62½ ton Insley, 50′ mast, 70′ boom.
1—15 ton Clyde, 30′ mast, 45′ boom. 1—11 ton Fort Pitt, 38′ mast, 70′ boom. Also a number of wood stiff leg derricks, 1 to 5 ton cap.

HOISTS (Electric, Gas, Steam
85—Electric, ranging from 30 H.P. up to 125 H.P. consisting of triple-drum, double-drum and single drum, with AC or DC motors, some with attached swingers. Following makes: American, Clyde, Lambert, Lidgerwood and National.

Quite romantic! But with Construction Equipment there is no nice time for a breakdown. That's why you should buy *depend*-able equipment from E.C.A.

Gas moists ranging from 8 to 120 H.P., single, double and triple-drum; all standard makes (38 in stock).
Steam, ranging from 8 H.P. to 60 H.P., single, double and triple-drum; all standard makes.

PNEUMATIC TOOLS
Column Drifters and Tripods
4—Model 17 Denver rock drills.
3—Sullivan high-speed drills, Model FG-3.
5—Ingersoll Rand type X71 drifters.
4—Gardner Denver drills with drifter mountings.

JACKHAMMERS
8—Jackhammers, consisting of Hardsoco, Worthington and Cleveland. 45 lb. and 85 lb. class.
4—Ingersoll Rand Model BCR-430 jackhammers, 47½ lb.
1—No. 3 Hardsoco 50 lb.

WAGON DRILLS
2—Gardner Denver derrick drills with Model 21 Gardner Denver drill; will drill 30 ft.
1—Ingersoll Rand drill, size D, with utility air hoist and Ingersoll Rand X71 drill.
1—Ingersoll Rand Model FM-2 drill, with Ingersoll Rand air hoist, size X71 drill, mounted on pneumatic tires; will handle 20 ft. steels.
2—Ingersoll Rand, Model FM-2, with air hoist and IX71 drill, mounted on 3 steel wheels; will handle 20 ft. steels.
1—Ingersoll Rand drill No. 3122, with X71 drill, mounted on 4-wheel trucks; will drill up to 36 ft. deep holes.

WE ALSO HAVE A LARGE STOCK OF DRILL STEEL WITH MISCELLANEOUS TIMKEN BITS.

PUMPS
We have a large stock of centrifugal pumps, gas and elect. powered from 1½″ to 10″. Also Dredging and vertical pumps.

PARTIAL LIST ONLY — SEND FOR 48 PAGE STOCK LIST

All this equipment is owned by us and may be inspected at one of our plants. WE BUY — REBUILD, SELL AND RENT.

CHICAGO 12, ILL.
1160 S. Washtenaw Ave.

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P. O. Box 933
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NEW YORK 7, N. Y.
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EQUIPMENT CORPORATION of AMERICA

DIESEL POWER UNITS

8 HP NEW Sheppard Diesels
25 HP NEW Sheppard Diesels
100 HP Murphy, Mod. ME-4
135 HP Murphy, Mod. ME-6
130 HP Caterpillar, D-13000, with gen.
140 HP Fairbanks-Morse, 12 x 16
200 HP Fairbanks-Morse, type Y, style V
240 HP Fairbanks-Morse, type Y, style VA
360 HP Fairbanks-Morse, type Y, style VA
300 HP Fairbanks-Morse, type Y, style V

GASOLINE UNITS

100 HP 5½ x 7 Waukesha heavy duty shovel engine, 4 cyl. 800 RPM
110 HP 6 x 7 Wisconsin, 4 cyl. 800 RPM
165 HP LeRoi, 6 cyl.
60 HP Caterpillar, 4 cyl.
50 HP PA-50 International, 6 cyl.
50 HP P-411 Continental, 3⅞ x 4½, 6 cyl.

ALL ABOVE UNITS NEW, REBUILT, OR RECONDITIONED, F.O.B. OUR WAREHOUSE

GENERAL MACHINERY & EQUIPMENT COMPANY
809 Woodland Ave. Kansas City 6, Mo.
Victor 0018

50″ x 24″ Champion Jaw Crusher
36″ x 24″ Farrel Jaw Crusher
36″ x 18″ Farrel Jaw Crusher
36″ x 15″ Farrel Jaw Crusher
36″ x 6″ Farrel Jaw reduction Crusher
24″ x 13″ Farrel Jaw Crusher
26″ x 15″ Farrel Roll Crusher
Barber-Greene Model 82-A Bucket Loader
12′ x 4′ Telsmith Double Deck Vibrator Screen
12′ x 3′ Symons Double Deck Vibrator Screen
10′ x 5′ Niagara Single Deck Vibrator Screen
24′ x 5′ Traylor Positive Drive Revolving Screen
24′ x 5′ Traylor Trunion Drive Revolving Screen
18′ x 3′ Acme Trunion Drive Revolving Screen
160′ center 30″ belt Conveyor with or without belt, frame, and speed reducer
125′ center 30″ belt Conveyor with 6″ Channel iron frame, with or without belt and speed reducer
148′ center 24″ belt Conveyor with 6″ Channel iron frame, with or without belt and speed reducer
116′ center 24″ belt Conveyor with 6″ Channel iron frame, with or without belt and speed reducer
78′ center 18″ belt Conveyor with 6″ Channel iron frame, with or without belt and speed reducer
45′ center 18″ belt Conveyor with 6″ Channel iron frame with or without belt and gear reduction

FRANK A. KREMSER & SONS, INC.
3435-45 NORTH 5TH STREET
PHILADELPHIA 40, PA.
Office Phone Regent 7272
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PIPE New & Reconditioned
ALL SIZES for ALL PURPOSES
Cut and Threaded to Your Specifications
VALVES AND FITTINGS
UNITED PIPE & SUPPLY CO. Dept. 101, NORRISTOWN, PA.

EQUIPMENT FOR SALE

1—8 ton VULCAN Standard gauge gasoline locomotive.
1—4½ ton Plymouth 24" gauge gasoline locomotive. Model FL.
1—56 ton BALDWIN 0-6-0 steam switching type locomotive, cylinder 19" x 24".
1—Lot Westinghouse 9½" locomotive air pumps, rebuilt.
1—INDUSTRIAL WORKS 17 ton steam locomotive crane, 8 wheels, 52′ boom. N. B. boiler.
4—50 ton capacity FLAT CARS, std. gauge. 40′ long, steel underframes.
20—Small 30" gauge 4 wheeled platform cars, Timken bearings: Bed 5′ x 8′.
1—WILLIAMS ½ yard "Favorite" type clam shell bucket.
1—P. & H. model 700-B crawler type gasoline dragline, 60′ boom & fairleads.

Send us your inquiries for rebuilt equipment.

Southern Iron & Equipment Co.
Plant & General Offices.
P. O. Box 2029, Atlanta 2, Ga.

Good Used Trucks and Trailers For Sale Below Ceiling or For Rent

BROCKWAY 7½-ton 6-wheel Drive with 260" Wheelbase, 200 HP Engine. Fine for Truckcranes or 6000 gal. Tanks, or any top load up to 20 tons.
WHITE 6-ton 6-wheel Drives, 200" W. B. 175 HP Engine. Just right for use with semi-trailers, logging dollies, or 10 yd. Dump Bodies.
CUMMINS Diesel Engines 200 HP in stock for above trucks or as power units.
GMC 2½-ton 10 Wheelers, 145" & 164" W. B,. 6- & 4-wheel Drives, 9 & 12 ft. Cargo Bodies, or 5 yd. Dumps, or for small logging operations.
CHEVROLET 1½-ton 4x4, Cargo Bodies.
DODGE ½-ton 4x4 Command Cars.
SUPERIOR 4-ton Trailers, 8 tires, new enclosed steel van body 18′x8′x 8′. Ideal as portable job offices or tool sheds. For sale or for rent.
RELIANCE 7-ton Semi-Trailer Cargo.

KEN ROYCE COMPANY
MOTOR SALES DIVISION
201 Bayshore Blvd., San Francisco 24
VAlencia 5121

For Sale—

SHASTA DAM SAND AND GRAVEL PLANT EQUIPMENT

Including—
GOODYEAR 36" SPECIAL-MAKE BELTING FROM 10-MILE CONVEYOR
16,000′ of Belt Remaining
With Idlers, Pulleys, and Drives

ALSO—
Electric Motors, Line Equipment, Transformers and Supplies
Pendulum Boom 42" Belt Conveyors, 100′ and 200′
Merrick Feedoweights and Weightometers
Dorr Hydroseparator, 20′ x 4′
Marcy Rod Mill, 8′ x 12′
Vibrating Screens
Trestle and Tripper
Dorr Rake and Bowl Classifiers
Gravel Washer: Extra-heavy Blade Mill
Pumps: Centrifugal, Deep-well, Steam, Dredge
Auxiliary Equipment: Chain Hoists, Winches, Welding Machines, etc.

Subject to Prior Sale

Write, Wire, Telephone Redding 1440

COLUMBIA CONSTRUCTION CO., INC.
Box 579 Redding, California

FOR SALE

The following equipment in usable condition:

One 1933 Diamond T three-ton truck with 1939 model Blaw Knox, three-yard horizontal type transit mixer.

One 1931 three-ton Diamond T truck with 1940 T. L. Smith two-cubic yard high discharge type mixer.

Equipment may be inspected at the

THE BECKMAN SUPPLY COMPANY
527 Michigan Street, Hammond, Ind.

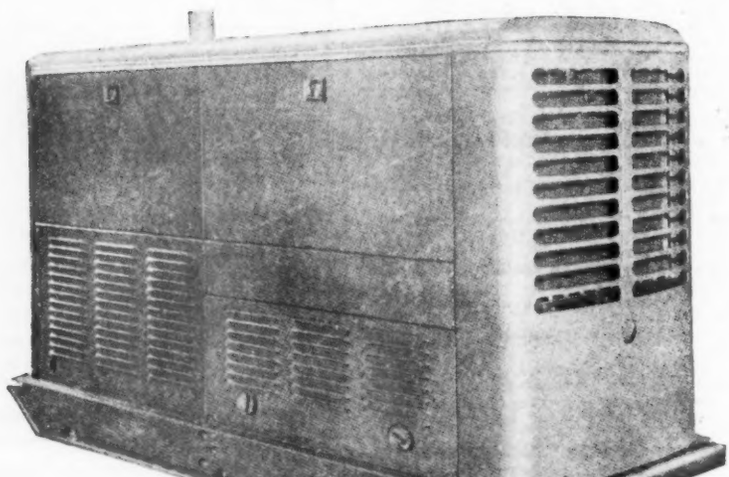
CRUSHERS — SCREENS

Austin-Western 10 x 20 Roller Bearing Crusher—on skids
Universal 10 x 20 Roller Bearing Crusher—on skids
Telsmith 9 x 36 Roller Bearing Jaw Crusher—on skids
Gilson #16 Pulverizer
Austin-Western Revolving Screen 32" x 12′ with dust jacket. New.
Pioneer Revolving Screen 36" x 16 ft. with dust jacket. All in guaranteed good condition.

NIXON MACHINERY & SUPPLY CO., INC.
Chattanooga, Tennessee

SELLING RAPIDLY 30 K. W.—50 K. W.

PORTABLE DIESEL GENERATOR SETS



INTERNATIONAL UD-14—UD-18
BRAND NEW—SPOT DELIVERY
RADIATOR COOLED—SKID MOUNTED
FULLY ENCLOSED

60 CYCLE
127/220 VOLT

50 CYCLE
230/400 VOLT

ROBERT SCHOONMAKER
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1—79 ton American 0-6-0 separate tender switcher, built 1920, superheated boiler, piston valves, Walschaerts valve gear, rebuilt and brought up to date on all I.C.C. requirements.

1—26 ton American 0-4-0 saddle tank, standard gauge, A.S.M.E. boiler, entire new firebox, completely overhauled, coal burner.

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300	G. E.	I-M	2200	514
150	A. C.	ARY	440	880
150	Wtg.	CW	440	580
150	G. E.	I-M 3b.	2200	585
100	Wtg.	Vertical	2200	1160
100	Ideal	AV-A45031	2200	720
100	Wtg.	HF	440	230
75	Nwtn.	HW-50	220	1740
75	G. E.	I-M	440	900
60	A-C	ARY	220	690
50	G. E.	I-M	220	855
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On those jobs you win with a sharp pencil, there's no room for compressors and air tools that waste air or have a habit of quitting at the wrong time. Avoid interruptions and air-power losses by using Blue Brutes.

Let's take a 315′ Blue Brute Portable Compressor, for example. You'll like the way light, tight, quiet Feather* Valves help squeeze the most air out of each gallon of fuel . . . the way special unit coupling in 3-point suspension cushions engine and compressor against vibration, shocks, distortion . . . the way the smooth-running Diesel or gasoline engine drives the compressor. And especially will you like the way it powers such air tools as Rock Drills, Paving Breakers, and Wagon Drills.

If you don't know it already, it will pay you now to investigate why a Blue Brute air-power team beats construction schedules and keeps costs low by saving hours and dollars by speeding up the work. You'll find, as others have before you that in construction equipment *there's more worth in Worthington.*

*Reg. U. S. Pat. Off.

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KNOW YOUR

BLUE BRUTES

Your Blue Brute Distributor will gladly show you how Worthington-Ransome Blue Brute construction equipment will put your planning on a profitable basis and prove that *there's more worth in Worthington.* Act now! His name is listed on page 239.

RANSOME EQUIPMENT

Blue Brutes include: Pavers, Concrete Spreaders**, Concrete Mixers, Concrete Placing Equipment, Big Mixers, Finishing Machines**, Pneumatic Placing & Grouting Equipment, Truck Mixers, Plaster & Bituminous Mixers, and related equipment.

WORTHINGTON EQUIPMENT

Blue Brutes also include: Diesel, gasoline and electric driven Portable Compressors from 60 to 500 cu. ft. capacity in mountings to suit all jobs; Rock Drills and Air Tools in a wide range of weights and sizes; Contractors' Pumps**.

**To be announced

Get more WORTH from air with WORTHINGTON

BUY BLUE BRUTES

Compressors from 60 to 500 cu. ft. capacity in mountings to suit all jobs. Rock Drills and Air Tools that have always set the pace for easy operation — available in a wide range of weights and sizes.

WORTHINGTON

Worthington Pump and Machinery Corporation, Worthington-Ransome Construction Equipment Division Holyoke, Mass.